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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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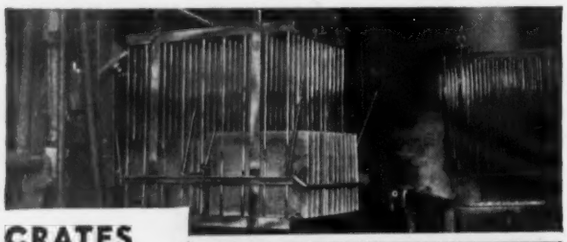
PRODUCTION · PROCESSING · DISTRIBUTION · USE

IF IT HANDLES PARTS FOR *Pickling* ... MAKE IT OF *Monel*

Steel Mills use this tough, corrosion-resistant metal for many different types of Pickling Equipment



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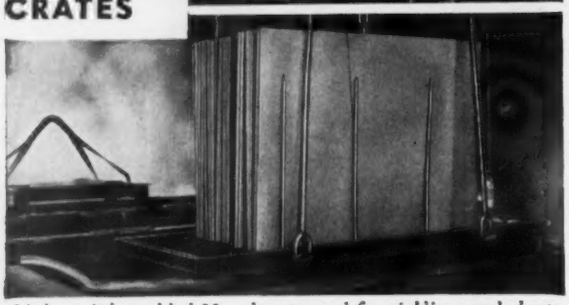
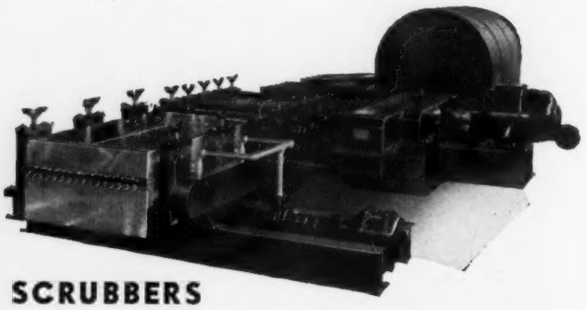


Light weight welded Monel crate used for pickling steel sheets prior to tinning. Welded Monel sheet mill crate in lower photo also has eyebars and separator pins of Monel.

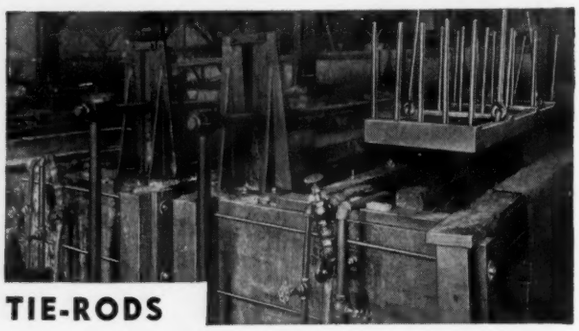
CHAINS, HOOKS

Welded Monel pickling chain, 1" dia. 5' 7⅞" long, 1½" end link with forged Monel hook. All standard sizes are available.



SCRUBBERS

This scrubber scrubs and dries 45-inch steel sheets. Scrub tank and tongues which take hold of sheets are made of Monel.



TIE-RODS

Wood pickling tanks are kept tight with tie-rods of Monel.

YOKES *Monel yokes of many designs are used for pickling coils of steel wire.*

BUILD light weight and long life into your *pickling crates*, by all means. But why stop there? Glance at the photographs on this page and see the many other places where Monel* cuts costs and greatly reduces repairs and replacements in steel mill pickling equipment.

Briefly, you'll save by using Monel for *any* kind of equipment that handles a load and operates in and around pickling acids. The reasons? First: Monel equipment needs no extra weight – for Monel resists corrosion, retains its original strength. Second: Monel's unique combination of strength, toughness and resistance to corrosion assures long years of *dependable service*.

There's a wealth of data you'll appreciate in the two bulletins, "Equipment Designs for the Pickle House" and "A Good Start to a Better Finish". Write for them today.

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STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ BUSINESS minds converged in New York last week (p. 15) agreed that 1939 will be a better year than 1938, though many shades of opinion were expressed as to the scope of expected improvement. Undoubtedly, the formula for better times is known, and was expressed in the National Association of Manufacturers' platform; now it remains to be seen what degree of co-operation can be re-established between business and government. The Square Deal—keynote of some speeches— may come to have more importance to the public than the New Deal . . . . Measured by 1929 output, 1938 in steel is a 51 per cent year, production of ingots and castings now closely estimated (p. 19) at 29,183,000 gross tons. This is about 58 per cent of the 1937 tonnage; and in between 1934 with 26,000,000 and 1935 with 34,000,000 . . . . New steel demands (p. 83) are holding up well, despite the approach of holidays.

• • •

Sporadic "wildcat" strikes and walkouts continue to slow down automobile production (p. 29) and union heads apparently are unable to control members. . . . Foreign machine tool buying (p. 30) is holding its own and bulks large in current specifications. . . . Trained and experienced engineers are in a favorable position to interpret policies for the working man (p. 20) and thus improve industrial relations, said Gerard Swope, president, General Electric Co., in addressing the American Society of Mechanical Engineers in New York. . . . New products and new models were inspected by 40,000 visitors (p. 21) at the National Exposition of Power and Mechanical Engineering.

Foreign Tool Sales Hold

• • •

Ten million idle employables constitute America's No. 1 problem. In STEEL'S Forum on Re-employment (p. 36), W. E. Whipp, president, National Machine Tool Builders' association, suggests three requirements for recovery: Free flow of investment funds; freedom from unreasonable and punitive taxes; willingness on the part of labor to give a full day's work for a full day's pay. . . . Carnegie-Illinois Steel Corp. has put into operation its 44-inch slabbing mill at Braddock, Pa., (p. 27) preliminary to formally opening the new Irvin works Dec. 15. Slabs weighing up to 45,000 pounds, will be transported 6½ miles to the Irvin works where they will be converted into tin plate, sheets and strip.

Program for Recovery

• • •

Providing proper lubrication for modern continuous strip mills (p. 38) requires not only a careful selection of lubricants but the use of adequate automatic systems for handling them. . . . Modern-day operation of a blast furnace finds the use of instruments (p. 52) playing an essential role in the control of materials, stack performance and product. . . . Cost of protecting iron and steel against the ravages of corrosion ranges from 50 cents to $1 a ton (p. 66) despite progress in combating destruction. . . . Speeding up its presses by equipping them with friction clutches (p. 50), a stamping manufacturer has gained a necessary increase in production, and at the same time has reduced power consumption and die breakage.

Strip Mill Lubrication

• • •

Safe practice is essential in connection with welding and cutting operations. Observance of established rules (p. 63) is the best insurance against mishaps. . . . A dredging company finds flame hardening (p. 78) to be not only a satisfactory but an economical process for making special cast steel pump liners wear-resisting, where other methods have failed. . . . Uniform hardening of heat-treated blanketed strip steel parts is obtained (p. 56) when the quenched section is in agreement with carbon and manganese content. . . . Placing belt conveyor drives at the head end is conventional practice, but a new arrangement (p. 48) permits installation at any point along the belt with definite advantages.

Safety in Welding

E. L. Shaner

"That Mark Steers You Clear of Trouble"

"Sure, I've seen all kinds of sheets go through the works," says a veteran of more than 20 years in a big automobile body plant.

"Yes, they're all made of steel. So are all cigars made of tobacco, but you don't get the same satisfaction from all cigars. Sheets can vary, too.

"I'll take Inland Sheets because that diamond trade-mark steers you clear of a lot of trouble, and the men from Inland are on the job every day watching quality and service."

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

More Business Improvement Forecast

At Congress of Industry

NEW YORK

■ AMERICAN industry seeks the co-operation of all elements of the nation's society to produce prosperity, said Charles R. Hook, president, American Rolling Mill Co., Middletown, O., in his keynote address as president, National Association of Manufacturers, before the forty-third Congress of American Industry.

Mr. Hook offered five recommendations toward this objective:

"1—Let governmental and industrial emphasis be placed on increased production, for it is the total production of goods and services which determines the standard of living.

"Before our nation's economy can be described as sound, the unemployed must be put back to work in productive enterprise and paid with money which is not supplied by the expedient of taxes. Increasing government control of industry will not make more jobs.

"2—Constant encroachment of government competition upon private enterprise must be eliminated if we are to create that confidence which is essential to the flow of corporate and private savings into production and trade.

"3—The American people are becoming tax conscious. It is a healthy sign. It means they are becoming more and more interested in the affairs of their own government. The people are beginning to realize that excessive taxation frightens away capital that otherwise might be invested and provide more jobs, leaves business with less money to pay those already working, and is reflected in higher prices.

Taxes Need Overhauling

"Our present tax structure and our taxing methods are in need of a complete overhauling.

"I urge that the President appoint a commission of qualified legislators and informed laymen to study the entire field of taxation. A little less emotional and a more practical approach to the problem is imperative if, as a nation, we are to escape serious trouble. The growing tendency to employ the taxing power for regulatory rather than revenue purposes should be abandoned.

"4—We need in the United States a national labor relations policy based on the American conception of fairness and common sense, a policy that encourages industrial peace and discourages the use of force and arbitrary methods. Full national recovery never can be registered in a confused atmosphere of industrial strife. Strikes obviously are a source of unemployment; they have cost many millions.

"5—Give American business a chance to operate under a Square Deal. To make America go ahead we must put our nine million unemployed back to work. We cannot regain prosperity until we do. That was apparent in 1933; it is equally so now."

On the whole, the meeting reflected considerable more enthusiasm about business and the political outlook than was manifest at the 1937 gathering. This was referred to by William B. Warner, chairman of the board of the association and president, McCall Corp., New York.

"We meet in an atmosphere of somewhat lessened apprehension," he said. "We approach enhanced opportunity for industrial expansion and we must re-establish faith in our ability to provide jobs under satisfying conditions for those who desire work. And the humanitarian progress that we all desire can be achieved only if production is moved up," he declared.

Sentiment of the manufacturers was cheered further by the forecasts of two leading economists.

"My personal feeling," said Dr. Virgil Jordan, president, National

Steel Submarine Tanks Store Food, Fuel

■ **Fearing it may become Europe's next battleground, Switzerland is making plans to store food and fuel in specially constructed steel tanks submerged in lakes, if war comes. As an experiment, 13 tons of wheat was placed in this container and submerged in Lake of Zurich for 14 days. The test proved successful. NEA photo**

Industrial Conference board, New York, "is that the volume of business as a whole will be larger next year than in 1938, but not so large as in 1937 or 1936. I do not expect that the industrial production index will equal the high point of 1937 for any considerable period next year, or that it will reach the 1929 level again at any time in the next two years."

Dr. Jordan was less optimistic about the long-view prospects. "I believe that the general trend of private business activity in this country has been downward since 1929, and that real recovery of enterprise from the great depression has not yet begun.

"I think that this situation will continue until a sufficiently large part of the American public and of the business community decides whether the United States is going to operate permanently under an authoritarian economic organization or under an enterprise organization, and makes its decision effective and generally understood both at home and abroad."

Dr. David Friday, president, National Bureau of Economic Research, New York, regarded the present recession in buying as a very minor one based on the fact inventories are well built up for the moment. The worst that can happen, in his opinion, is that January, February and possibly March will reflect some leveling off of business. He believes the country is headed for an early resumption of the kind of business enjoyed in the period culminating in 1929. In particular, he sees a building boom of vast proportions ahead—provided building costs are held down.

Testing Public Opinion

Dr. George Gallup, director, American Institute of Public Opinion, New York, described the method of ascertaining accurately what the public thinks by using a carefully devised sampling method. He urged manufacturers to study public opinion with the thoroughness they devote to commercial activities. Recent surveys indicate public opinion will demand an overhauling of the Wagner act from the next congress.

Congress also will sense more public opposition to government spending. On the other hand, public opinion is in favor of expenditures necessary to improve national defense.

Warm applause greeted Dr. Gallup's prediction President Roosevelt is unlikely to be re-elected in 1940. While the President continues to enjoy a large amount of popularity, the majority oppose a third term.

Place for American business to settle its legislative and public relations problems is in the homes of the people and not in the national capitol or lobbies of state legislatures, said Don Francisco, president, Lord & Thomas, New York.

Fundamentally, he inferred, the problem of building effective public relations is a simple one. First a company must find and correct its mistakes. Then it must heal its sore spots. After that it is ready to make new friends by telling its story of social service.

Robert L. Lund, executive vice president, Lambert Pharmacal Co., St. Louis, and chairman of the association's public relations committee, urged businessmen to "go into politics, not as business executives, but as private citizens of a great republic, to battle for those principles in which you believe."

The American people, Mr. Lund said, will not continue to accept ten million unemployed persons as normal in a nation abounding in facilities for greater production.

There is no area in the world where we have a better opportunity to develop happy and mutually profitable relations than in Latin America, declared W. Gibson Carey Jr., president, Yale & Towne Mfg. Co.

The United States is helped there by excellent representatives of American business, adequate American banking facilities and the fact that more than four billions, or more than one-third of our international investment is in Latin America.

A good neighbor policy will best serve our interests there.

But all over Latin America our policy in regard to Mexican expropriations is being watched. The United States must stop expropriation at any cost, said Mr. Carey. What we do now on this matter will have a profound effect on our future foreign relations.

Trade Pacts May Recoil

H. L. Derby, president, American Cyanamid & Chemical Corp., New York, saw a dangerous situation in the fact European rearmament has been an important factor in increasing our exports under reciprocal trade agreements. Should any appreciable portion of the fifteen million men now at work on the manufacture of war materials in Europe be released for other production, the reciprocal trade treaties will pave the way for invasion of our markets.

As a result of extensive discussions with farmer groups, W. W. Shoemaker, vice president, Armour & Co., Chicago, chairman, association's committee on agricultural cooperation, cited some questions farmers are asking:

How can prices be stabilized and how can this be done without regimentation and centralized control of both industry and agriculture?

Why does farm machinery cost more than it used to cost although the farmer must accept less for what he produces?

How can farm surpluses be utilized? Is the answer more export markets, further industrial utiliza-

New Officers, National Manufacturers' Group

Howard Coonley
Elected president, National Association of Manufacturers

■ Howard Coonley, chairman, Walworth Co. Inc., New York, was elected president, National Association of Manufacturers, for the coming year. Charles R. Hook, president, American Rolling Mill Co., retiring president, becomes chairman of the association's board. William B. Warner, president, McCall Corp., New York, becomes chairman of the executive committee.

Vice presidents include: H. W. Prentis Jr., president, Armstrong Cork Co., Lancaster, Pa.; Lammot du Pont, president, E. I. du Pont de Nemours & Co., Wilmington, Del.; Sinclair Weeks, president, Reed & Barton Corp., Taunton, Mass.; Howard G. Tallerday, president, Western Pipe & Steel Co. of California, San Francisco; W. T. Holliday, president, Standard Oil Co. of Ohio, Cleveland; Walter J. Kohler, chairman, Kohler Co., Kohler, Wis.; C. S. Davis, president, Borg-Warner Corp., Chicago.

New directors include: W. S. S. Rodgers, president, the Texas Co., New York; W. L. Batt, president, SKF industries Inc., Philadelphia; J. Howard Pew, president, Sun Oil Co., Philadelphia; W. B. Bell, president, American Cyanamid Co., New York; W. A. Carson, president, Sunbeam Electric Mfg. Co., Evansville, Ind.; Blaine S. Smith, Universal Atlas Cement Co., Chicago.

tion of farm products, crop control —or is there still another approach?

Are reciprocal trade treaties helping or hurting agriculture?

These and other questions must be answered at some point in the rapidly developing relationship between industry and agriculture, declared Mr. Shoemaker, adding that fair prices to farmers for their products are essential to the welfare of manufacturing industry. He called for industry's support for any effort in this direction.

Lewis Morris, Des Moines, Iowa, farmer, asked industry to keep hands off the AAA.

This plea was seconded by W. W. Waymack, editor, *Des Moines Register and Tribune*. In the interest of creating a workable, prosperous and stable American society, he declared, industry was deliberately promoted by national policies. It now is essential, he held, to plan to re-create that kind of balance by bulwarking agriculture.

Hits Deficit Financing

Paul Cadman, president, American Research Foundation, defined deficit financing as a process that leads to bankruptcy. On the question as to how far we as a nation can go in debt, he said it first is necessary to ask whether the debt is going to be paid.

Unsound taxes are helping prolong this country's unsatisfactory economic situation, declared H. Boardman Spalding, counsel, A. G. Spalding & Bros., New York. He is chairman of the association's committee on government finance.

Mr. Spalding advocated: Broadening the income tax base; eliminating the tax on intercorporate dividends; taxing corporate profits at a uniform rate; eliminating what is left of the tax on undistributed profits; eliminating normal individual tax on dividends; permission to file consolidated returns; corrections in the statutory definitions of net income; improved treatment of inventory profits and losses and simplification of depreciation.

The people again are beginning to understand that what is good for business is good for them, said C. M. Chester, chairman, General Foods Corp., New York. He urged manufacturers to merchandise with renewed vigor and do more than ever before to promote usage of their products.

"We also must do everything possible to stabilize employment, cooperate with employes in providing protection against old age, sickness and death, provide healthful and safe working conditions," said Mr. Chester. "And we must protect the right of employes to bargain with management wherever and however they desire and through whatever means they desire, uninfluenced from any source, as becomes free Americans."

Unanimously approved by the congress was a program calling for co-operation of industry, commerce, labor and agriculture with government. It called for restoration of the unemployed to jobs in private industry.

To this end, the program contemplates, business should:

Recognize human responsibilities, accept economic and social responsibilities, be frank with the public, maintain high standards, lower prices as feasible, maintain sound employe relations, recognize labor's right to bargain collectively, maintain good working conditions and cushion effects of technological unemployment.

Government should: Adjust fiscal policy to attract investment, to create new machines, to create new jobs for the unemployed to increase purchasing power by increasing production; improve governmental efficiency, lower its costs and not compete with private business.

The program proposed creation of a nonpartisan committee to study the whole tax problem, favored encouragement of foreign trade by every legitimate means. It recognizes government's right to "regulate" for the good of all but not to "control."

Board Briefs Employer's Duties Under Security Act

■ A pamphlet entitled "Brief Outline of Employer's Duties Under the Social Security Act" has been prepared by the federal social security board and bureau of internal revenue.

Since delinquency interest and penalties increase with lapse of time, the circular is said to be intended to clear up confusion which delays some employers in filing returns and making tax payments. Its 30 sections describe details of employer procedure in compliance with the security act's old-age insurance and unemployment compensation provisions.

Senator Nye To Back Embargo on Scrap Exports

■ Senator Gerald P. Nye, North Dakota, stated in Washington last Friday that during the coming session of congress he will fight for a bill to place an embargo on exports of scrap iron and steel from the United States.

As member of the military affairs committee during the last congressional session he attended many hearings on the subject.

New Use for Hulett Machine

■ NEW YORK city's department of sanitation has placed an order with Wellman Engineering Co., Cleveland, for designing, fabricating and erecting a stationary Hulett-type unloader for unloading rubbish and garbage from barges and loading it on crawler-type tractor trailers. The refuse is to be used to reclaim waste lands in the New York area.

The machine will be similar to automatic ore unloaders. The principal difference is that the main frame will be stationary, and the receiving hopper fixed in the frame.

The bucket attached to the lower end of the stiff-leg will be 7 feet wide and when opened will have a spread of 22 feet, with a capacity of 12 cubic yards. Speeds of the several motions will be co-ordinated so that in free digging, 90 cycles per hour may be made, providing for a maximum unloading rate of not less than 1000 cubic yards per hour. The operator's station will be in the bucket leg.

The savings to result from the use of the machine over present methods is estimated to be more than $140,000 per year.

Wellman also received an order recently for a large electric mine hoist having two 11-foot diameter by 8-foot, 6-inch face drums, with power operated brakes and clutches, for Canada.

Bethlehem Acquires Oil Field Warehouse Facilities

■ Bethlehem Steel Co. has concluded negotiations for certain assets of the International Supply Co., Tulsa, Okla., formerly a subsidiary of Oklahoma Iron Works, manufacturers of oil and gas field equipment. The transaction will give Bethlehem added warehouse facilities in the oil field.

New California Firm To Make Metal Plane Parts

■ Continental Aeronautic Corp. has been organized in Burbank, Calif., with initial capital of $560,000 to fabricate metal aircraft parts.

Headed by E. J. Rivers, former executive of North American Aviation Inc., the company has acquired a 161,000-square foot factory and in January will begin manufacture of metal wings, spars and braces.

Lieut. Commander G. O. Noville, Byrd expeditions explorer, is vice president in charge of sales. W. R. Angell Jr., president of Continental Motors Corp., and R. M. Allen, California Engine Co., are vice president and secretary-treasurer, respectively.

Twenty-five Companies Protest Public Contracts Steel Wage Proposal

■ A PETITION was filed last week with the public contracts board by a committee representing small eastern steel producers requesting reconsideration of the 62½-cent steel wage minimum under the Walsh-Healey law.

Up to Saturday, 25 iron and steel manufacturing and fabricating companies and two industrial associations had filed protests with the board. Closing time for objections is Dec. 12.

The committee is composed of D. S. Wolcott, vice president, Lukens Steel Co., Coatesville, Pa.; J. H. Parker, vice president, Carpenter Steel Co., Reading, Pa., and John T. Whiting, vice president, Alan Wood Steel Co., Conshohocken, Pa.

Among the companies they represent, besides their own, are: Atlantic Wire Co., Branford, Conn.; Buffalo Bolt Co., North Tonawanda, N. Y.; Buffalo Steel Co., Tonawanda; Central Iron & Steel Co., Harrisburg, Pa.; Cohoes Rolling Mill Co., Cohoes, N. Y.; Henry Disston & Sons, Philadelphia; Harrisburg Steel Corp., Harrisburg, Pa.; Heppenstall Co., Pittsburgh; E. J. Lavino Co., Philadelphia; Midvale Co., Philadelphia; Phoenix Iron Co., Phoenixville, Pa.; Rome Strip Steel Co. Inc., Rome, N. Y.; Simonds Saw & Steel Co., Lockport, N. Y.; South Chester Tube Co., Chester, Pa.; Troy Furnace Corp., Troy, N. Y.; Universal-Cyclops Steel Co., Bridgeville, Pa.

Political Considerations Cited

"Circumstances strongly support the suspicion that political considerations have played a part in this whole matter," said Roberts B. Thomas, New York, counsel for the petitioners.

"In the first place a summary of the report was released just before the recent election. The news of the board's report was given wide publicity in the sections affected and particularly in eastern Pennsylvania on the day before election.

"Meanwhile, nothing but a press release was available to the companies affected by the report. Washington refused to disclose its full text.

"Eventually, under a bombardment of protesting demands, a full text of the report was released. Then it was discovered that it contained a minority report by one of the three members of the board, a fact previously concealed, and to which no reference was made in the press release on the report made just before the election."

The petition alleges that the board has not properly applied the provisions of the act in recommending 62½ cents minimum for northern manufacturers. Because it fails to give effect to long existing wage differentials between localities, a general disturbance of wage rates throughout the steel industry and in other industries would result.

"Is it the purpose of the board that competition for government work be limited only to the large companies? Such a determination as that recommended will be disastrous to many small producers, particularly those with plants in the East, whose services the government has accepted in the past and needs now for the furtherance of its plans for national defense."

St. Louis Body Objects

Protest also was filed last week by the St. Louis chamber of commerce. The chamber states that if the minimum in St. Louis is increased "as is arbitrarily proposed under the present recommendations the increased cost of production will be reflected not only on the business which may be secured from the government, but on all business for which the manufacturer may endeavor to compete. There appears to be no sound basis for dividing the country into only two groups (North, 62½ cents; South, 45 cents) nor is there justification for grouping St. Louis with Chicago and Pittsburgh. Such action is not warranted by the prevailing minimum wage in the respective areas and is highly prejudicial to the St. Louis manufacturers."

The Stanley Works, Bridgeport, Conn., also filed a protest stating that it will be impossible to find other plants in New England, whatever they manufacture, which pay higher rate to common labor than 55 cents and few that pay higher than 50 cents.

"So far as New England is concerned," the company says, "although it was a pioneer in steel business, natural economic disadvantages have resulted in practical elimination of steelmaking in New England and there are only few steelmakers left in the section, of which we are one. Study of past history and present status discloses that proposed inclusion of eastern district in a northern district with common labor rate of 62½ cents will result in discrimination in fact against this district."

The Carpenter company, Crucible Steel Co. of America, New York, and Associated Industries of Missouri, St. Louis, also sent protests.

Carpenter states the recommendation of 62½ cents per hour for 36 states is not in accordance with a finding of fact nor with law, because facts show that in the eastern district the prevailing wage rate is 56½ cents, and the recommended rate should not exceed this.

Crucible points out the contracts act clearly indicates the wage minimum shall be that prevailing in the locality in which materials are to be manufactured. The phrasing definitely intended the secretary of labor "would not lightly disregard such clearly defined geographical differentials in the wage structure of an industry as have been demonstrated in the testimony before the public contracts board to prevail in the steel industry."

Pointing to findings in other industries, Crucible requests the secretary to recognize this precedent in arriving at steel wages.

Associated Industries of Missouri urges that in final determination of steel wages in Missouri industrial districts the authorization given to the secretary in the act "be strictly followed, and that the prevailing wage for similar industries operating in the locality shall be given proper consideration." The association says the average common labor wage in Missouri is 55 to 58½ cents.

British Machine Tool Deliveries in 50 Weeks

■ Fifty weeks is the average delivery date now current for British produced machine tools, according to the machinery division, bureau of foreign and domestic commerce, Washington. However, with respect to new orders for types employed for quantity production of fighting aircraft propulsion components, no delivery dates are being mentioned.

Eighteen weeks, the division reports, is the average American undertaking, but in the more specialized lines a somewhat shorter period is commonly offered. The slack home demand is said to be responsible for the quick deliveries American producers can promise.

Germany continues to supply machine tools in volume and at prices reported to vary between 25 and 40 per cent below prices quoted on comparable products of American manufacture. This price differential is not serving much to prevent the tendency of British users to demand American machinery from becoming stronger. The explanation lies in an increasing incidence of faulty German components, especially heavy castings and in a growing tendency on the part of German makers to offer money compensation for faulty parts and to refuse to replace them.

November Ingots Up 14.6 Per Cent

■ STEEL ingot production in November totaled 3,572,220 gross tons, 14.6 per cent over 3,117,934 tons in October and almost 66 per cent more than in November, 1937.

This was the fifth consecutive monthly gain and the first month this year to exceed the corresponding period last year.

Operations in November averaged 62.05 per cent of capacity, the highest rate since September, 1937, with 76.30. In October the rate was 52.45 per cent, and in November, 1937, 38.23 per cent.

The average of STEEL'S weekly estimates of operations in November is 61.13 per cent, less than 1 point below actual performance as reported by the American Iron and Steel institute.

Average weekly production in November was 832,685 tons, against 703,823 tons in October and 502,183 tons in November, last year.

Estimated total 1938 production of open-hearth, bessemer, crucible and electric ingots and steel castings is 29,183,000 gross tons.

Comparable figures for these steels in 1937 were 50,568,701 tons; 1929, 56,433,473.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Dec. 10	Change	Same week 1937	Same week 1936
Pittsburgh ...	43	— 4	19	75
Chicago	59.5	+ 3	24	77
Eastern Pa...	37	None	29	49.5
Youngstown..	65	None	24	79
Wheeling	62	None	30	92
Cleveland ...	66.5	— 5.5	31	75.5
Buffalo	49	None	21	84
Birmingham..	75	None	45	74
New England.	80	+ 4	36	91
Cincinnati ...	75	None	29	92
St. Louis	51.5	None	20.6	68
Detroit	86	+ 2	52	95
Average....	61	None	27	77.5

Celebrate Stainless Steel's 25th Anniversary

■ Development of stainless steel 25 years ago will be commemorated at a meeting of representatives of stainless steel producers in Pittsburgh, Tuesday, Dec. 13. B. F. Fairless, president, United States Steel Corp., will be toastmaster.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.....	1,632,773	30.25	99,991	18.27	1,732,764	29.15	391,143	4.43
Feb.....	1,578,233	32.38	125,493	25.40	1,703,726	31.74	425,931	4.00
March.....	1,854,669	34.36	157,737	28.83	2,012,406	33.85	454,268	4.43
April.....	1,793,522	34.31	131,644	24.84	1,925,166	33.44	448,757	4.29
May.....	1,676,215	31.06	130,590	23.87	1,806,805	30.39	407,857	4.43
June	1,519,589	29.07	118,688	22.40	1,638,277	28.46	381,883	4.29
July.....	1,854,076	34.43	127,982	23.44	1,982,058	33.42	448,429	4.42
Aug.....	2,350,199	43 54	196,789	35.97	2,546,988	42.85	574,941	4.43
Sept.....	2,449,861	46.98	207,887	39.32	2,657,748	46.28	620,969	4.28
Oct.....	2,894,726	53.63	223,208	40.79	3,117,934	52.45	703,823	4.43
Nov.....	3,370,974	64.50	201,246	37.98	3,572,220	62.05	832,685	4.29
11 mos....	22,974,837	.....	1,721,255	.....	24,696,092	.....	517,520	47.72
1937								
Jan.....	4,426,227	84.07	292,209	54.38	4,718,436	81.32	1,065,110	4.43
Feb.....	4,083,070	85.89	331,629	68.34	4,414,699	84.27	1,103,675	4.00
March.....	4,814,926	91.45	403,400	75.07	5,218,326	89.94	1,177,952	4.43
April.....	4,682,084	91.83	388,783	74.71	5,070,867	90.25	1,182,020	4.29
May.....	4,769,238	90.59	382,671	71.21	5,151,909	88.79	1,162,959	4.43
June	3,900,108	76.50	284,615	54.69	4,184,723	74.48	975,460	4.29
July.....	4,220,848	80.10	335,456	62.56	4,556,304	78.48	1,030,838	4.42
Aug.....	4,504,567	85.29	373,259	69.46	4,877,826	83.83	1,101,089	4.43
Sept.....	4,021,035	78.80	268,472	51.71	4,289,507	76.30	1,002,221	4.28
Oct.....	3,204,209	60.67	188,715	35.12	3,392,924	58.31	765,897	4.43
Nov.....	2,040,480	39.90	113,885	21.88	2,154,365	38.23	502,183	4.29
11 mos.....	44,666,792	.....	3,363,094	.....	48,029,886	.....	1,006,493	47.72
Dec.....	1,386,188	26.31	86,833	16.19	1,473,021	25.37	333,263	4.42
Total	46,052,980	74.20	3,449,927	54.54	49,502,907	72.38	949,423	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ STEELWORKS operations last week increased in three centers, declined in two and remained steady in seven. The national rate is estimated at 61 per cent, unchanged from the preceding week.

Cleveland—Declined 5.5 points to 66.5 per cent as one mill further curtailed. Indications are for a rise this week.

Youngstown, O.—Unchanged at 65 per cent, with 55 open hearths, three bessemers and 14 blast furnaces in production. This week year-end factors are expected to reduce activity to 58 per cent, with four less open hearths and bessemer capacity curtailed.

St. Louis — Unchanged at 51.5 per cent. Mills have backlogs of finished products, and no excess of ingots. This indicates continuance of this rate or higher.

Cincinnati — Steady at 75 per cent, with active buying and some accumulation of bookings.

Detroit — Up 2 points to 86 per cent. One producer continues 15 of its 16 open hearths, the other adding one, making seven of nine active. One unit is scheduled to go down this week for repairs.

Buffalo — Addition of an open hearth by one producer and dropping of one by another kept the rate steady at 49 per cent, 21 furnaces being active.

Birmingham, Ala. — Continued at 75 per cent. Rate will rise to 80 per cent this week when Tennessee Coal, Iron & Railroad Co. lights its twelfth open hearth, giving the district 17.

New England — With two steelworks at 100 per cent the district rate has risen 4 points to 80 per cent. The same is scheduled for this week.

Pittsburgh — Reductions by several producers have dropped the rate 4 points to 43 per cent. This is expected to hold for this week.

Wheeling — With 24 open hearths active, production continued at 62 per cent.

Central eastern seaboard — Output closely matches bookings and mills operated at an average of 37 per cent, the same as the preceding week.

Chicago — Advanced 3 points to 59.5 per cent due to increased activity by two producers. This is only half a point below the highest level this year.

■ Sharon Steel Corp., Sharon, Pa., has declared a regular quarterly dividend of $1.25 a share on the $5 cumulative convertible preferred stock payable Jan. 1.

Swope Tells Mechanical Engineers Need Is for Industrial Democracy

■ APPLICATION of engineering skill to the problems of industrial relations was stressed as an ever increasing need by speakers at the fifty-ninth annual meeting of the American Society of Mechanical Engineers in New York, Dec. 5-9.

Gerard Swope, president, General Electric Co., Schenectady, N. Y., delivering the annual Henry Robinson Towne memorial lecture, urged the direction of this skill toward "creation of an industrial democracy within the framework of a political democracy." He devoted much of his address to this general theme; other speakers made important contributions to the same subject.

The meeting program covered a wide range of mechanical and industrial engineering subjects, with 28 technical sessions scheduled and more than 70 papers presented, dealing with developments in engineering research, machine shop practice, metals, management and safety, fuels, lubrication and other fields. Approximately 3000 engineers and executives attended the sessions.

Honors Are Conferred

Honors night, Dec. 6, was the occasion for the award of society medals; formal introduction of the new president, Alexander G. Christie, professor of mechanical engineering, Johns Hopkins university, Baltimore, by Retiring President Dr. Harvey N. Davis, president, Stevens Institute of Technology, Hoboken, N. J.; announcement of the other new officers; and presentation of the Towne lecture by Mr. Swope.

The Holley medal was awarded to Francis Hodgkinson, honorary professor of mechanical engineering, Columbia university, New York, for "meritorious services in the development of the steam turbine"; the Worcester Reed Warner medal to Lawford H. Fry, railroad engineer, Edgewater Steel Co., Pittsburgh, for "written contributions relating to improved locomotive design and utilization of better materials in railway equipment"; and the Melville medal to Alphonse I. Lipetz, chief consulting engineer in charge of research, American Locomotive Co., Schenectady, N. Y., for his paper on "The Air Resistance of Railroad Equipment."

Announcement was made of the award of the A. S. M. E. medal to Stephen J. Pigott, Clydebank, Scotland, for outstanding leadership in marine propulsion and instruction. Presentation will be made next September at a joint meeting in New York of the society and the British Institution of Mechanical Engineers. Mr. Pigott was born in Cornwall, N. Y., and educated at Columbia university.

Honorary membership was conferred on Major-General William H. Tschappat, retired. He was former chief of ordnance and now resides at East Falls Church, Va.

For outstanding achievement in mechanical engineering for 1938, the Pi Tau Sigma medal was presented to Wilfrid E. Johnson, engineer, General Electric Co., Fort Wayne, Ind.

Alexander G. Christie
Installed as president, American Society of Mechanical Engineers. See STEEL for Oct. 24, page 33, for the complete list of new officers

Engineers, while achieving much within the usually conceived range of their profession, can do much in the field of industrial relations, Mr. Swope declared in his lecture, "Mechanical Engineering—Men, Materials and Methods."

"The engineer is in a particularly good position, with his training and knowledge, to interpret policies for a working man, to go along with him, not only in working out the best methods of production, but also the best results in industry from a human standpoint, individually and socially."

Mr. Swope said that if management, through the engineer and labor "find and interpret the facts of industry and come to peaceful conclusions as to the correct solution, there will be less occasion for laws compelling compliance, with the attendant evils of lack of cooperation and of rigidity."

Great advances have been made technologically, greater than in any other country. This, he said, is reflected not only in the wider distribution of a higher material standard of living, but also in the fact that the workman in this country has to work less time than in any other country for what is considered the basic elements of life. This is due largely to excellent work of the engineer, he said.

Progress in labor relations, though, has not advanced to the same extent, he pointed out, nor in an unbroken line across the front of industry.

"There has been no unanimity in management of industry, no meeting of minds even in any one industry, except in a few instances. Partly as a result, labor has gone ahead independently, favoring mandatory legislation. Industry and labor have paid the price in less co-operative and constructive effort, great rigidity, legal compulsion and long drawn out legalistic combats."

Social Security Only Started

Discussing social security legislation, Mr. Swope pointed out that a start had been made, but that the work had not reached a finality, either in scope or method. Greater understanding of objectives and better methods for accomplishing the desired results still lie ahead. In some fields he said a start has not even been made.

Much emphasis is being placed on peaceful settlement of industrial disputes, he added. Much time has been lost because of strikes, but much more time, Mr. Swope declared, is lost through sickness or unemployment. Something has been done in other countries and recently in this country to ameliorate tragic effects of unemployment, but much still remains to be done. Invalidity insurance is in force in many countries and this country is considering it. He concluded that management, through the engineer, has a great opportunity to stabilize and regularize employment and to insure the worker of a minimum annual wage.

"There are many opportunities where men with a broad engineering training and experience in factories can do much to improve the morale in industrial organization.

"Although management must stand for efficiency, this is not the only factor to be considered. Since industry is a part of democracy and a democracy is made up of human beings, the development and education of these human beings to provide for their growth, happiness and well being, must be sought."

The Robert Henry Thurston lecture, "Physiology for the Engineer," was presented at the annual dinner, Dec. 7, by Howard W. Haggard,

(*Please turn to Page* 45)

New Products, 280 Exhibitors, Large Attendance at National Power Show

■ MANY entirely new products and new models of standard lines were featured by 280 exhibitors at the National Exposition of Power and Mechanical Engineering in Grand Central Palace, New York, Dec. 5-10.

More than 40,000 registered visitors attended the show, which was held concurrently with the annual meetings of the American Society of Mechanical Engineers and the American Society of Refrigeration Engineers. Considerable optimism was expressed by exhibitors over prospects for 1939, and this was reflected in the increased attendance.

The show differed somewhat from those of other years in that many large exhibits were in evidence, especially in the materials handling field. One large cylindrical rubber conveyor for bulk materials shown by the Johns conveyor division, Osborn Mfg. Co., Cleveland, extended from the main floor to the second. A monorail system also was operated by the American Monorail Co., Cleveland. Probably the heaviest piece of equipment was a large coal stoker for steam boiler use displayed by the American Engineering Co., Philadelphia.

Iron and Steel Represented

Several iron and steel companies were well represented with animated exhibits, including a miniature tube mill. Several of the copper and brass mills featured products for use in the power and transmission field. Other exhibits included boilers and heaters, steam plant equipment, transmission equipment, air conditioning and refrigeration equipment, electrical apparatus, refractories, valves and fittings, flexible hose, lubricants, special machinery and various miscellaneous items. A further tendency toward alloys was noted as far as materials were concerned. A close view of the exhibits also revealed not only further refinements in the products themselves, but also in their applications, as well as simplicity in design.

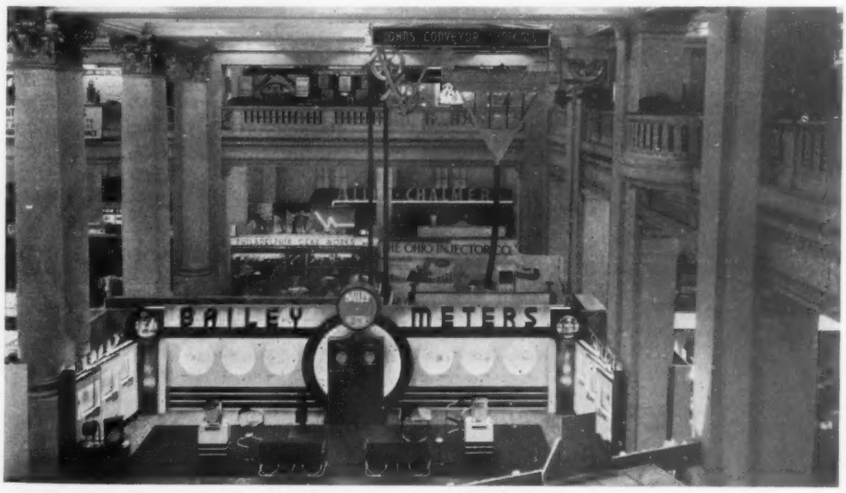
Included among the new products was a new line of wire rope electric hoists displayed by Yale & Towne Mfg. Co., Philadelphia. This company also has just introduced new heavy-duty electric lift trucks especially adapted for handling steel strip in coils. Wright Mfg. Co. division of American Chain & Cable Co. has changed the design of its hoists slightly to effect lighter weight, although not sacrificing strength. Also, it is now using cut gears on geared trolley hoists and cranes. Robbins & Myers Inc., Springfield, O., offered a line of electric wire rope hoists equipped with a new worm-gear drive.

Morse Chain Co., Ithaca, N. Y., showed a new variable speed control for material handling equipment, feeders, pumps, mixers, etc., which is easily controlled by a small hand wheel. Boston Gear Works Inc., North Quincy, Mass., exhibited a new straight-in-line ratiomotor for the first time, with new bevel gear boxes in horizontal and vertical types. The latter have hardened, ground and lapped, spiral bevel gears making them practically noiseless. Chain Belt Co., Chicago, included in its display a new universal conveyor chain which may be driven by sprockets in two planes, either horizontal or vertical.

Production Machine Co., Greenfield, Mass., will go into manufacture shortly of a new abrasive belt surfacer which features rapid adjustment from a vertical to a horizontal position in a few seconds. The Toledo Pipe Threading Machine Co., Toledo, O., is offering its conventional high-speed threader with a new clutch which releases or engages pipe with movement of lever.

Cutler-Hammer Inc., Milwaukee, showed a newly-developed direct-current controller for machine tools. This device accelerates the motor as it engages the load. Also on display was a new controller for large valves. The Armstrong-Blum Mfg. Co., Chicago, has equipped its medium-duty metal-cutting saw with ball bearing frame to aid operation.

In the valve industry, a further tendency was indicated toward use of alloy steels, including carbon molybdenum for valve bodies and bonnets. Makers of large valves are using welded seat rings. One maker uses oil-hardened stainless steel plates. Compressor valves machined from solid alloy steel forgings also were shown.



■ General view of the thirteenth National Exposition of Power and Mechanical Engineering in Grand Central Palace, New York, Dec. 5-10

LABOR

WESTINGHOUSE AHEAD OF WAGE LAW BY TWO YEARS

■ WESTINGHOUSE Electric & Mfg. Co., East Pittsburgh, Pa., will anticipate by two years final provisions of the wages-hours law by immediately initiating time and one-half overtime pay for all salaried employes working more than 40 hours per week.

According to announcement of George H. Bucher, president, the step will benefit 12,000 employes and is retroactive to Oct. 24, date when the fair labor standards act became effective. The law now specifies that overtime be paid for work in excess of 44 hours weekly, while hours are to be reduced to 42 next year and to 40 in 1940.

VOLUNTARY WAGE REDUCTION STUDIED BY TIN WORKERS

Workers at Port Vue mills of the McKeesport Tin Plate Corp., Pittsburgh, last week were considering a voluntary wage reduction with a view to lengthening the work week.

Employes called a mass meeting to discuss the proposal. L. D. Smith, vice president and general manager, attended at employes' request and addressed the gathering.

Later, SWOC officials intervened, wanted to make the proposal a union affair, appeared likely to block the plan.

The mill employs 2100 men and during the past two months has been working less than two days a week. Last week all operations ceased.

MEN OF INDUSTRY

■ CHARLES C. MILLER has been appointed manager of the new branch office opened by Continental Industrial Engineers Inc., Chicago, at 8186 Livernois avenue, Detroit. After completing an engineering course at the University of Michigan, Mr. Miller took post graduate work in metallurgy at Purdue. He has served many years in the engineering and operating division of Dodge Bros.' Detroit plant.

♦

Ralph Hare has been named New England representative of Electro-Alloys Co., Elyria, O., with headquarters in West Hartford, Conn.

♦

Arch Warner, until recently Michigan district manager, Logan Gear Co., Toledo, O., is now affiliated with the Mechanics Universal Joint division, Borg-Warner Corp.

♦

Rob't. H. Irons, president, Central Iron & Steel Co., Harrisburg, Pa., sailed Dec. 7 for Egypt and the Mediterranean, to be gone several months.

♦

K. L. Brenner has been appointed purchasing agent, Wabash Railway Co. and the Ann Arbor Railroad Co., St. Louis, succeeding T. J. Frier, retired. Mr. Brenner, a native of St. Louis, began his railroad service with the Missouri Pacific more than 25 years ago and has been with the Wabash since 1914.

♦

J. F. Frain, general superintendent, Babcock & Wilcox Tube Co., Beaver Falls, Pa., has resigned. He will take a position at the Gary works of Carnegie-Illinois Steel Corp. Jan. 1.

♦

Russell L. Willis, formerly associated with Bethlehem Steel Co. at St. Louis, has become assistant manager of sales, structural and bar division, Weirton Steel Co., Weirton, W. Va.

♦

W. W. Sebald, vice president and assistant general manager, American Rolling Mill Co., Middletown, O., has been elected a director of the company. He fills the vacancy caused by the death of J. H. Frantz, of Columbus, O.

♦

Bernard C. Case has joined the staff of the Hanson-Van Winkle-Munning Co., manufacturer of electroplating equipment and supplies, Matawan, N. J. Following graduation from University of Michigan, he engaged in chemical work, first with Eaton Mfg. Co., Cleveland, and later with Bridgeport Brass Co., Bridgeport, Conn. He also has done original research in electroplating and has taken out a patent, assigned to the Eaton company, on an anode for the control of pitting in nickel solutions.

Charles C. Miller

Karl L. Brenner

Bernard C. Case

♦

Robert W. Wilson, associated for eight years with Fay, Oberlin & Fay, patent attorneys, Cleveland, has opened his own office at 1010 Leader building, Cleveland, to continue the practice of patent law. He is a member, American Society for Metals and Cleveland Engineering society.

♦

Harold S. Card, the past two years director of the business development program of the electric welding section, National Electrical Manufacturers association, has inaugurated a sales, advertising and general promotional consulting service for manufacturers of welding equipment and materials. His headquarters are room 517, 30 Church street, New York.

♦

W. Homer Hartz, president, Morden Frog & Crossing Works, Chicago Heights, Ill., has been nominated as president, Illinois Manufacturers' association. Nominations for other officers include: First vice president, J. E. Otis Jr., Stewart-Warner Corp., Chicago; second vice president, Robert M. Gaylord, Ingersoll Milling Machine Co., Rockford, Ill.; treasurer, Sterling Morton, Morton Salt Co., Chicago.

♦

Arden L. Knight has been appointed district manager of sales in New England for Wheelock, Lovejoy & Co. Inc., with headquarters at 128 Sidney street, Cambridge, Mass. Following several years mill experience and sales work in the company's Cleveland and Detroit offices he was transferred to the home office in Cambridge. He is vice chairman, Boston chapter, American Society for Metals.

♦

Harry G. Bow has become manager of sheet sales, Reeves Steel & Mfg. Co., Dover, O. Widely known as a sheet steel salesman, Mr. Bow formerly was associated with Berger Mfg. Co., Canton, O., as general manager of sales, and later held a similar position with the Milwaukee Rolling Mill Co. He also was manager of sales, Superior Sheet Steel Co., Louisville, O., for a number of years.

♦

J. B. Morrow, former coal preparation manager, Pittsburgh Coal Co., Pittsburgh, has been made vice president in charge of production, succeeding L. E. Young, who becomes vice president in charge of engineering. Harry Miller, former production manager, and Ernest Taylor, chief engineer, have resigned.

William B. Poindexter has been appointed general sales manager, succeeding Walter L. Sheppard, ap-

pointed assistant to the vice president in charge of sales.

♦

S. J. Martin has been appointed manager, engineering department, Pittsburgh Piping & Equipment Co., Pittsburgh. Since graduation from Carnegie Institute of Technology, 1908, he has been associated with the piping industry. Prior to joining Pittsburgh Piping he was superintendent of erection of the piping installation at Carnegie-Illinois Steel Corp.'s new Irvin works.

♦

Dr. George Sachs, European authority on physical metallurgy, will join the faculty of Case School of Applied Science, Cleveland, in February. He will supervise X-ray and research work in the graduate division as well as teach undergraduate courses in the physics of metals. At present he is head of the

Dr. George Sachs

precious metals department, Baker Chemical Co. Dr. Sach's industrial positions include work as a designer on bridge construction, engineer on bearing metals investigations, vice president in charge of research, Duerener Metal Works and head of the mechanical and X-ray departments, Kaiser Wilhelm institute, Berlin. He has developed a method for determining the deep drawing properties of sheets, and has also developed several new alloys such as the aluminum-silicon-magnesium alloys now being used in German aircraft engines.

♦

Charles A. Ferguson has been transferred, effective Dec. 15, from the Farrell, Pa., plant, Carnegie-Illinois Steel Corp., to the Gary, Ind., plant where he will be assistant general superintendent of sheet and tin mills. E. P. Aldredge, heretofore general superintendent, National works, Monessen, Pa., will succeed Mr. Ferguson as assistant general superintendent, Farrell plant, in

S. J. Martin

direct charge of tin operations.

Mr. Ferguson entered the employ of the United States Steel Corp. in 1913 as assistant master mechanic, Vandergrift, Pa., works, while Mr. Aldredge has been in the employ of the corporation 35 years.

♦

Carnegie-Illinois Steel Corp., Pittsburgh, announces the following titles of supervisory personnel in the Homestead works engineering department: G. M. Miegs, chief design engineer; R. F. Gellert, project engineer; M. M. Marks, power and fuel engineer; W. J. Leslie, appropriation control engineer; C. O. Franklin, electrical engineer; H. F. Ramsey, construction engineer; and M. H. Van Cleve, office engineer.

♦

George A. Burnham has resigned as assistant manager of the electrical department, in charge of switchgear sales and engineering division, Condit works, Allis-Chalmers Mfg. Co., Boston, to devote more time to personal matters. He will, however, be retained in a consulting capacity.

W. S. Edsall, sales manager, succeeds Mr. Burnham. He entered the

E. E. Wright

Who has been appointed Cleveland district manager, Electro Metallurgical Sales Corp., New York, as noted in STEEL, Dec. 5, page 40

employ of the Condit Electrical Mfg. Co. in 1920; in 1922 was made sales manager; in 1928 was appointed general sales manager, American Brown-Boveri Co. and also a director of the Condit organization, and when Allis-Chalmers purchased these companies in 1931, Mr. Edsall continued as manager of sales for the Condit works and later for the switchgear division.

DIED:

■ CHARLES F. SMITH, 77, chairman of the board, Landers, Frary & Clark, New Britain, Conn., manufacturers of cutlery and electrical appliances, in that city, Dec. 4. He was a director, American Hardware Corp., Blake & Johnson Mfg. Co., and Goss & De Leeuw Machine Co.

♦

Philip Hart, 52, president, Pacific Bridge Co., Portland, Oreg., in an airplane accident off northern California coast, Nov. 29.

♦

A. W. Norton, 60, son of the founder of Continental Can Co. and a former vice president of the company, Nov. 30 at his home in Baltimore.

♦

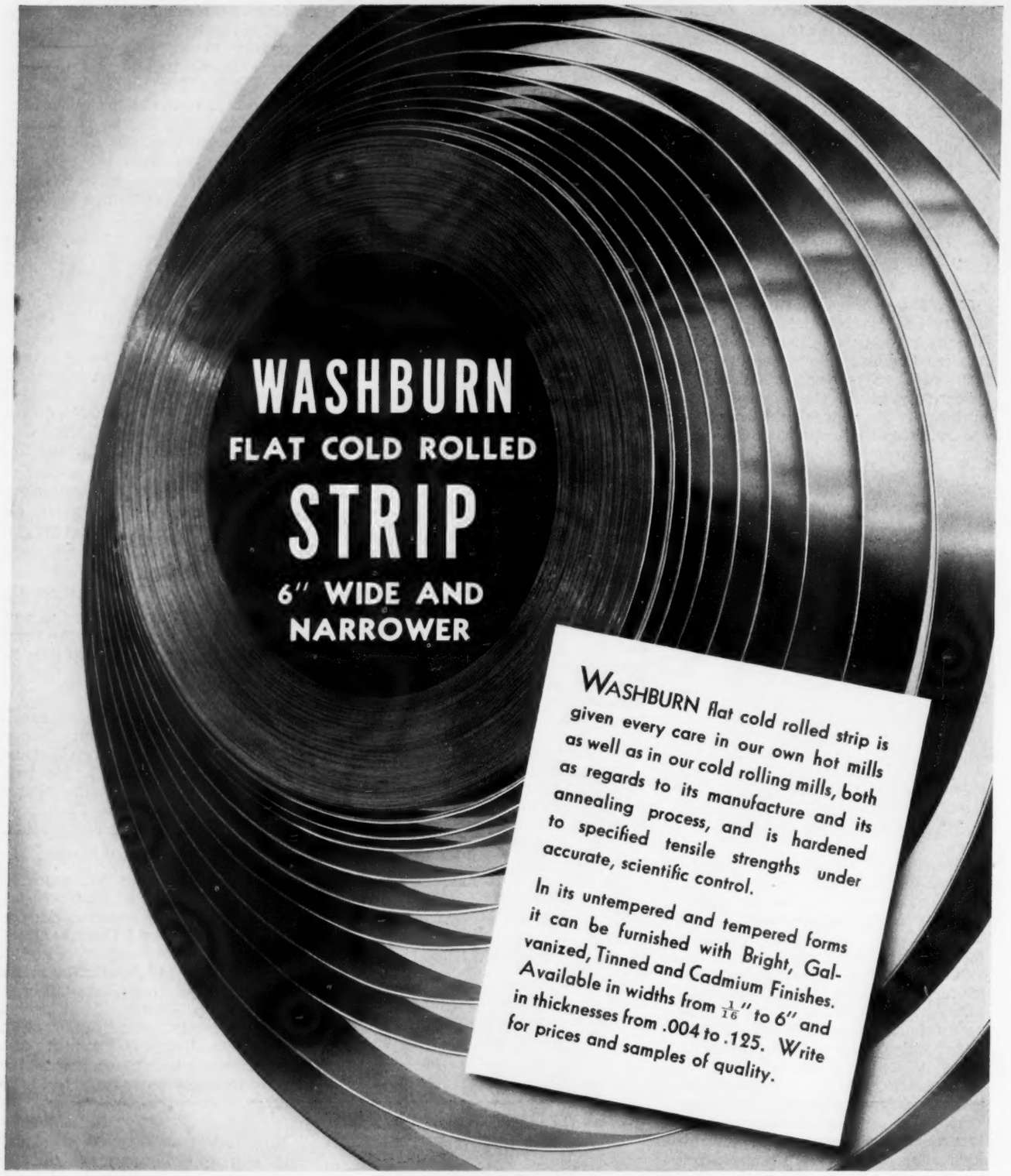
John H. Knapp, 44, vice president, Norge and Detroit Vapor Stove divisions of Borg-Warner Corp., in Detroit, Dec. 1. He was one of the founders of the Norge Rollator Refrigeration Co., now merged with the larger corporation.

♦

Dr. Porter Shimer, 81, reported to be the discoverer of titanium carbide, Dec. 7, at his home in Easton, Pa. A graduate of Lafayette, 1878, he lectured on iron and steel at Lafayette from 1894 to 1902. For many years he was president, Shimer Chemical Co., Easton. He received the John Scott medal of Franklin institute in 1901 for inventing the combustion crucible, and was the author of many papers on steel metallurgy.

♦

Eugene V. Ronceray, 69, president and managing director, S. A. des Etablissements Bonvillain et Ronceray, Choisy-le-Roi, near Paris, France, recently. He also was president and managing director, Universal System of Machine & Moulding & Machinery Co. Ltd., London, England. He was one of the founders and a past president, Association Technique de Fonderie de France, and a member, American Foundrymen's association. In 1926, during the Internationl Foundry congress in Detroit, he was awarded the latter association's J. H. Whiting medal.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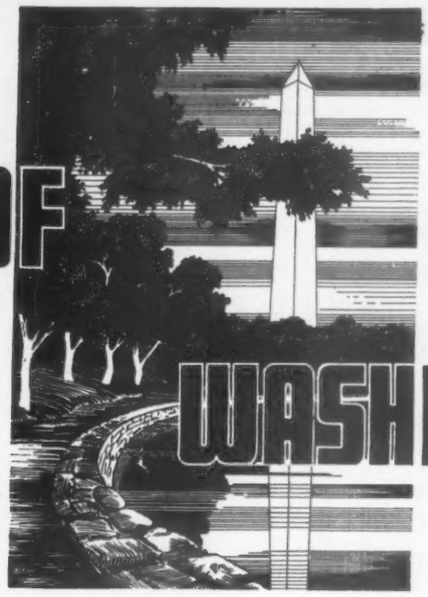
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

WINDOWS OF WASHINGTON



WASHINGTON

■ INCENTIVE taxation still is a "nebulous subject," both to congress and the public, Senator Vandenberg of Michigan, commented last week during a senate finance subcommittee's third week of hearings on profit-sharing.

The senator's statement was in reply to a witness, J. M. Frank, president, Ilg Electric Ventilating Co., Chicago, who expressed doubt about incentive taxation because he did not see how such a law would be framed.

Senator Vandenberg assured that no incentive tax law would be drafted until the subcommittee was convinced a practical system could be developed to encourage profit-sharing without harming those industries unable to operate a profit-sharing plan.

"This hearing," he said, "is just an exploration."

Industrialists testifying before the committee continued to offer widely varying news on profit-sharing and incentive taxation.

C. W. Hazelett, president, Hazelett Metal Co., New York, told the committee that taxes, if accompanied by lower taxes for those who maintain a high rate of employment, could solve the unemployment problem.

Would Make Idleness Expensive

Mr. Hazelett, who has written a book on incentive taxation, argued tax laws should be geared to the production of "tremendous" profits, which he said can come only from "great employment of money, men and property."

"We must make it so profitable for all these things to be in a high rate of production and so expensive for them to be in a low rate of production, that no class, be it labor or capital, can afford to be idle," he said.

Under his plan, he added, "obviously it will be too expensive for either labor or capital to strike."

"If labor is made idle by a strike, those responsible for the strike must support those made idle thereby. In any case, the responsibility for supporting idle people is upon those who make them idle, and labor has no fear of the lack of a job or of support."

He argued that the right to strike had not improved the condition of labor because a strike reduces production "and therefore real wages," and because capital also may strike in retaliation.

Cites Capital's Advantage

"The fact that capital can live much longer on its accumulation than labor," he said, "makes the strike of the latter absolutely futile."

Henry S. Dennison, president, Dennison Mfg., Co., Framingham, Mass., testified his company had had a form of profit-sharing since 1911, but the system "discontinued itself" in 1930 because the company went "into the red" that year.

Mr. Dennison warned against generalization about the benefits of profit-sharing and asserted a plan which worked for one company might fail for another.

L. M. Giannini, president, Bank of America, San Francisco, recommended a more varied distribution of the tax burden to eliminate a "psychology handicap" which he said is holding back industrial expansion.

Mr. Giannini endorsed proposals for tax allowances to industries who institute profit-sharing programs.

Walter Schwartz, Philadelphia textile machinery manufacturer, suggested taxes be lowered immediately to a rate which would balance government revenue and expenses if national income were $80,000,000,000 or $90,000,000,000 a year.

"Let the budget get out of balance," Schwartz said. "If you lower taxes materially now, business will increase so that the national income soon will reach $80,000,000,000 or $90,000,000,000 and revenue will balance outgo. Then we can turn to the serious business of balancing the budget."

Willard H. Dow, president, Dow Chemical Co., Midland, Mich., attacked government spending and, responding to a question from Senator Vandenberg, Michigan, agreed the incentive he preferred would be to "have government mind its own business."

Herbert D. Brown, Glendora, N. Y., efficiency expert, suggested employers be allowed to deposit with the federal treasury funds to be held in reserve to bolster pay rolls in depressions.

Miles E. Robertson, general manager, Oneida Ltd., of Oneida, N. Y., outlined employe benefit plans by which he said employes had received 41 per cent of the company's earnings in the last ten years.

PIERSON STUDIES MACHINERY EXPORT CREDIT PROBLEMS

Warren Lee Pierson, president, Export-Import bank, recently held a conference with machinery exporters to discuss the bank's present facilities and to learn some of the machinery trade's export finance requirements. Bank officials and exporters felt existing difficulties are not insurmountable and that a number gave promise of solution.

In a statement last week Mr. Pierson said: "The Export-Import bank was chartered by congress for certain definite purposes. It has certain reasonable legal limitations. It is a bank, and must function as

BY L. M. LAMM
Washington Editor, STEEL

a bank. Funds are to be advanced for the promotion of export, and a good volume of business is being handled.

"We cannot participate in obviously unsound transactions, nor willingly accept only your poorer risks. That would not be good banking practice. We also cannot give out in advance any specific set of requirements which, if followed, will enable you in any 'sure-fire' manner to be certain of our approval in advance.

"Infinitely varying circumstances in regard to the credit of the foreign buyer, the exchange and political situation in his country, and your own financial position will demand that each transaction shall be considered on its individual merit.

"From your viewpoint, export sales are at times lost because you have not been able to extend credit to an importer overseas for a period of two, three or five years. You have heard that some of your foreign competitors are enjoying financing aid from their governments far beyond that which is available to you. In some cases you have encountered instances of downright subsidy. You have, all this while, been wondering what the Export-Import bank is prepared to do for you.

"Well, it is evident that we should work this out together. You will hear further about this matter. Please don't come to expect too much; but I believe we will be able to go forward."

RAILWAY EQUIPMENT EXPORTS EXCEED 1937 SHIPMENTS

Exports of railway equipment and supplies from the United States during October were valued at $1,169,068, compared with $1,002,501 during September, and $1,266,088 during October, 1937, according to the department of commerce.

Foreign sales of railway equipment and supplies from the United States during the first ten months of this year were valued at $12,965,073 compared with $9,439,155 during the corresponding period of 1937.

Shipments to noncontiguous territories during October were valued at $18,996 compared with $20,961 in October last year.

ARNOLD EXPLAINS VIEWS ON ANTITRUST CAMPAIGN

Antitrust law enforcement must be linked to the successful operation of the economic system rather than used blindly to disturb the efficiency of mass production or to upset orderly marketing conditions, the national economic committee was told last week in a statement by Thurman Arnold, head of the antitrust division, department of justice.

A departmental member of the committee, Mr. Arnold took the occasion to clarify and defend the antitrust laws and government policy "against such restraints of trade as unreasonably hamper the free flow of goods in commerce at competitive prices."

"This basic ideal is often sabotaged by distorting it into a statement that mere bigness is in itself an evil under all circumstances, and by implying that we seek to pursue trust-busting as an end in itself rather than as an instrument to remove obstacles to the full use of capacity."

"If industry cannot bring its prices within the reach of purchasing power," Mr. Arnold warned, "it is difficult to see how industrial activity can be maintained without government spending."

One objective of the present inquiry, he added, will be to examine "how the antitrust laws may have a constructive application, through consent decrees and systematic cooperation with legislative committees, in cases where certain combinations may be found in the public interest."

Named Chief of Metals, Minerals Division

W. A. Janssen

■ Walter A. Janssen, chemical and metallurgical consulting engineer, Washington, has been appointed chief of the metals and minerals division, department of commerce, to succeed R. L. Harding of Cleveland, who recently retired to enter private business.

Mr. Janssen was born in Davenport, Iowa and was graduated from the University of Wisconsin with a bachelor of science and chemical engineering degree.

He has had considerable experience in the steel industry. For ten years, he was general superintendent of the steel foundry division, Bettendorf Co., Davenport, Iowa. He was operating manager of Canadian Steel Foundries, Montreal, from 1917-1919; later, assistant vice president of the American Steel Foundries, and then manufactured chemicals.

He did a consulting business in Pittsburgh as a chemical and metallurgical engineer, and subsequently became general manager for International Vanadium Corp., at Moab, Utah. In 1919 he was vice president of the American Foundrymen's association. During the NRA Mr. Janssen was a deputy administrator in charge of the mining and quarrying division.

INDUSTRIAL BROADCASTS TO START JAN. 8

A series of weekly industrial broadcasts will begin Jan. 8 under department of commerce auspices.

It is reported Edward R. Stettinius, chairman, United States Steel Corp., and many other leading business men will be interviewed during a 15-minute period by Assistant Secretary of Commerce Patterson.

WON'T "CODDLE" DOMESTIC MANGANESE INDUSTRY

President Roosevelt denied the domestic manganese industry would be "coddled" as a factor in the national defense program. He said such a move would be too expensive.

The Chief Executive pointed out, however, in answer to a question, that studies have been made with a view to stocking up materials which this country lacks, such as manganese.

ZINC INSTITUTE PROTESTS AGAINST TARIFF REDUCTIONS

American Zinc institute has filed a protest with the state department against tariff concessions granted on zinc ore and slab zinc in the new trade agreement with Canada. The institute urged the concessions be withdrawn before the agreement goes into effect Jan. 1.

The institute asserts the injurious effects of the agreement already have become apparent in the unsettling of the domestic market, in threatened shutdowns of mines and smelters, and in prospective wage reductions and layoffs for employes.

GOVERNMENT STEEL AWARDS

In the week ended Dec. 3, the government purchased, under the Walsh-Healey act, iron, steel and their products amounting to $80,321.40 as follows: Treadwell Construction Co., Midland, Pa., $20,395.00; Bethlehem Steel Co., Bethlehem, Pa., $28,556.40; Columbian Steel Tank Co., Kansas City, Mo., $16,875.00; Johnson City Foundry & Machine Co., Johnson City, Tenn., $14,495.00.

Largest Slab Mill To Supply Irvin

■ CARNEGIE-ILLINOIS STEEL CORP. has just put into operation its "world's largest slabbing mill," preliminary to formally opening the new Irvin works, Clairton, Pa., on Dec. 15.

The unit, built as an addition to Edgar Thomson works, Braddock, Pa., is a 44-inch mill capable of rolling 1,500,000 tons of slabs annually. These slabs, weighing up to 45,000 pounds, will be transported 6½ miles to the Irvin works. There they will be converted into tin plate, sheets and strip.

With 52½ acres under roof, Irvin works is unique among steel plants in a number of ways. One of its distinguishing features is that it will be free of smoke. With the exception of two boilers in the powerhouse, the entire plant will be operated on a smokeless basis, employing electricity and fuel gas.

Irvin works' 653 acres form a plateau 227 feet above the Monongahela river. Within this area are 17 main buildings, 13½ miles of standard gage railroad track.

In the manufacture of tin plate the works will require annually 1800 gross tons of Straits tin, costing approximately $2,000,000, and 129,200 gallons of palm oil for polishing.

A complete description of the works will be found in STEEL, Dec. 19.

Canadian Steel, Iron Output Up in October

■ October steel ingot and castings output in Canada was 76,256 gross tons, compared with 73,556 tons in September, and 114,527 tons in October, 1937. Pig iron output in October was 50,657 tons; 49,972 tons in September, and 80,922 tons in October last year. Ferroalloys totaled 2194 tons, against 3174 tons in September.

For ten months steel output amounted to 987,261 tons, compared with 1,191,989 tons in the corresponding period a year ago; pig iron, 605,502 tons, against 735,360; ferroalloys 44,513 tons, compared with 63,140.

Canadian Imports Lower

■ Imports of steel and iron into Canada in October were valued at $12,579,000, compared with $20,155,000 in October, 1937. Value of imports from the United States declined from $16,014,000 to $10,451,000.

The latter included: Machinery, $2,367,000; automobile parts, $2,205,000; plates and sheets, $1,107,000; automobiles, $779,000; farm implements, $629,000; miscellaneous rolling mill products, $477,000; engines and boilers, $322,000; castings and forgings, $224,000; tools, $119,000; stamped and coated products, $115,000.

Johns-Manville Builds Three New Plants

■ Three new plants, costing $4,000,000, soon will be placed in operation by Johns-Manville Corp., Lewis H. Brown, president, announced recently. The new capacity plus increased activity at present units will give work to at least 1000 more persons, he said.

A plant now under construction at Jarratt, Va., is expected to start manufacture of insulating board products early in 1939. At Watson, Calif., production of rock wool home insulation and transite pipe recently was started. Third unit, soon to open at Richmond, Ind., will manufacture stonefelt, newly developed insulation for refrigerators, railroad cars, automobiles and airplanes.

Mr. Brown announced the new plants' openings in dedicating his company's exhibit at the New York world's fair.

Burden Iron Co., 125 Years Old, Quits Business

■ Burden Iron Co., Troy, N. Y., established in 1813, will cease operations this month and its assets taken to meet creditors' claims.

"Continued depression in the railroad business has forced the company to go out of business," an official statement said. The company has been in reorganization since March, 1937, under section 77-B of the federal bankruptcy law.

The Burden family entered the firm in 1820 or 1822 and the company was incorporated in New York in 1881. Originally a puddled iron nail factory, it also made bars and boiler rivets. During the Civil war, it supplied the bulk of horseshoes for the northern army. Recently the company has manufactured staybolt iron, bars, rivets and horseshoes.

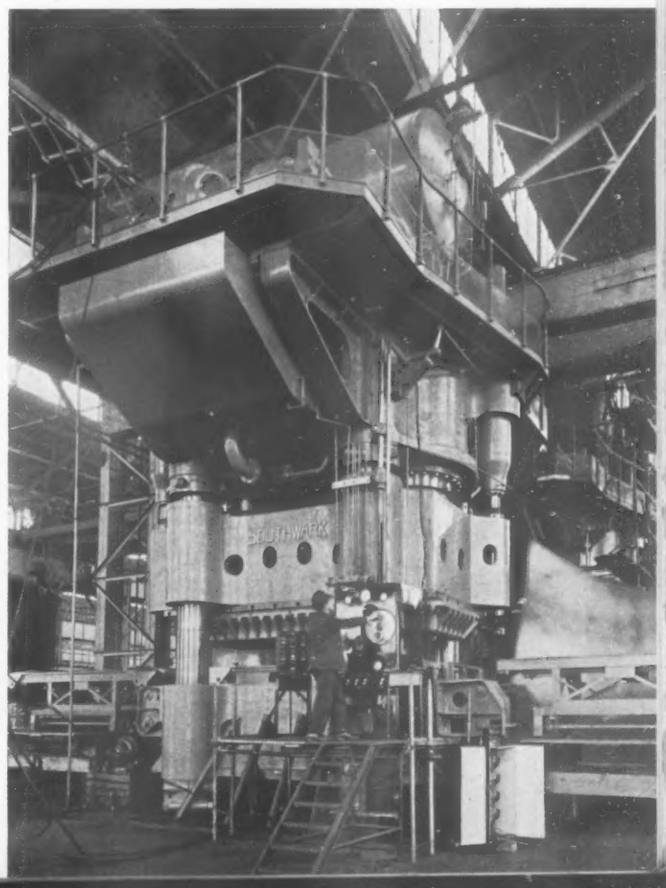
Equipment includes 11 double puddling furnaces, eight oil-fired heating furnaces and two squeezers.

American Plane Exports Reach All-Time Peak

■ Aircraft exports attained a record high of $58,283,328 in the first ten months this year, 88 per cent over the same period last year, according to the department of commerce. October exports totaled $4,948,153 compared with $3,662,559 in October, 1937.

Total airplane exports in 1936 were valued at $11,386,896, and in 1935, $6,638,515.

Massive Press for Aircraft Parts



■ This 5500-ton capacity hydraulic press is one of three designed and built by Southwark division, Baldwin-Southwark Corp., in its Eddystone plant, especially for forming duralumin aircraft parts.

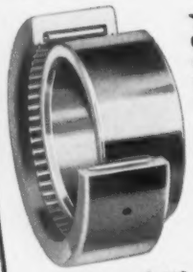
The press, of rapid-acting type, is completely automatic, having control of pressure, operating speed, and length of stroke. It also is equipped for semi-automatic or manual operations.

Huge, single steel castings, the platens weigh approximately 160,000 pounds each. The press is 33 feet high, weighs approximately 960,000 pounds

DOING OUR BEST

TO KEEP UP WITH THE DEMAND!

STANDARD SERIES QUILL BEARING



★ ONE-PIECE channel-shaped outer race with rollers definitely retained.

★ Simplified design—No fragile parts—Easy to assemble.

★ Rigid surfaces, accurately hardened and ground, confining rollers endwise.

★ High load carrying capacity—minimum space requirement.

★ Low cost made possible through large production. Simplified design.

★ Correctly proportioned rollers with husky curvilinear trunnions.

Carried in stock in sizes for shafts from ½" to 5"

WHEN the Standard Series of Bantam Quill Needle Bearings was introduced in September we said "Carried in Stock." And we meant it! But we had no idea that the demand for these bearings, in a number of sizes, would far exceed our ability to produce them. So, for a short time we were unable to make immediate shipments.

We thought that a bearing with all the advantages of *lower cost, higher capacity and longer life* offered by the Bantam Standard Quill Bearing would get an immediate response. But we hadn't expected such a quick acceptance.

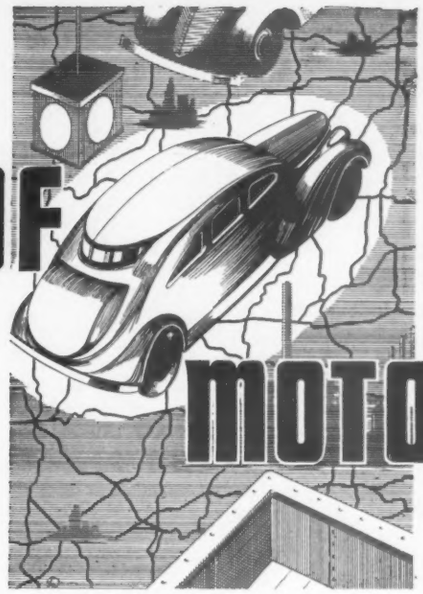
Production has now been stepped up. By the time this message reaches you, we can again say "Carried in Stock" and mean it. Your orders will be promptly filled in all sizes from ½" to 5" shaft.

BANTAM BEARINGS CORPORATION
SOUTH BEND, INDIANA
Subsidiary of THE TORRINGTON CO.
Torrington, Conn.

BANTAM BEARINGS

TAPERED ROLLER • • • STRAIGHT ROLLER • • • BALL BEARINGS

MIRRORS OF MOTORDOM



DETROIT

BY A. H. ALLEN
Detroit Editor, STEEL

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■ LABOR disturbances continue to throttle efforts of the automotive industry to get production above the 100,000-weekly level, and serious concern is beginning to be felt over the recurrence of strikes and walkouts, many of them based on trivial incidents and settled in a few hours. So highly integrated are the industry's manufacturing operations, however, that a tieup in a department involving only a handful of men can throw an entire plant or several plants out of gear.

The recent strike at a Fisher Body plant in Flint quickly was reflected in a shortage of bodies at the Buick assembly line, causing a stoppage there, and later the supply of fenders at Pontiac was exhausted and that plant had to close. About a day's production was lost by both these plants.

Discharge of a union steward after he had been "disrespectful to a foreman" at the Nash-Kelvinator plant here led to stoppage of work by day shift employes, members of the Mechanics Educational Society of America, but the trouble was adjusted in a few hours and operations resumed.

The UAW has disciplined four of its members for the unauthorized instigation of a recent strike in the Plymouth plant, protracted layoffs being meted out to the guilty persons. However, it is believed this action was not taken until the company made it plain to the union that some evidence of good faith in living up to contracts was mandatory.

UAW Can't Control Members

It is a peculiar thing that when these strikes first are called, union leaders in the plants declare the walkouts have been authorized by the UAW executive committee, but later statements from union headquarters invariably are to the effect the strikes are of the "wildcat" variety—entirely unauthorized. The thin control which the UAW is able to exert over its various locals is apparent.

Last week, Homer Martin, UAW president, issued a statement to officers of his locals, emphasizing that "unauthorized strikes will not be tolerated under any conditions."

At the same time he restated the five steps necessary to obtain authorization for a strike: (1) Approval in secret ballot by two thirds of the local members; (2) approval of the action by the regional director; (3) filing of written reports on the issues involved; (4) proof that all steps provided in the contract between the company and the union for settlement of grievances have been exhausted, and (5) written authorization to strike from Martin. It is doubtful if any of the recent walkouts have complied with these five provisions.

Design for Striking

These days a strike comes about approximately in this way: A small group of men in a plant get together to exchange complaints about how little attention has been given to some minor grievance submitted weeks previously; gradually they become more and more incensed until a decision is reached to get the gang together and walk out. On the way out they usually telephone union headquarters saying a strike has been called.

It is related how current agitation at the Chevrolet forge plant here is being fomented by a group of about 10 per cent of the present two-shift force, each of which works 40 hours per week. These men want the work week reduced to 32 hours so that a third shift of several hundred men can be rehired.

The management has taken the position that such a step is economically unsound, but that if the men insist, two shifts of 32 hours each can be arranged, with the balance of the work being sent out of town. There the matter rests, and negotiations are now being conducted between the men and the management, with some reports being heard to the effect the management is half inclined to close the entire plant and move operations elsewhere if a definite settlement is not reached soon. However, this is believed to be a hasty threat, no doubt made in the heat of argument.

■ LABOR squabbles which seem to infest practically all automobile producers' plants are not heard from any of Ford's plants and if difficulties do develop there, they are effectually squelched before they reach outside ears. Optimism is rampant at Ford these days, with production veering upward toward 5000 per day and sales still outnumbering assemblies.

Finishing touches are being put on the Ford "blue room," the name applied to the new tool and die shop by virtue of the fact all equipment is painted the same shade of dark blue to differentiate it from the rest of the plant. Machine tool demonstrators are now busy in the plant setting up the final pieces of equipment and showing Ford operators the various kinks in its operation. Some of the new machines installed —and virtually everything in the plant is new—are of entirely different design, and builders naturally are particularly concerned that operating details be understood correctly.

In trade circles, the blue room is considered the largest and finest tool and die shop in the world, and sections of the division are already in routine production. Among various machines installed are a number of

the largest and most massive Keller machines ever constructed. These units are used to machine the large dies used for roof panels, fenders, body panels, etc.

Ford is the brightest spot in the equipment picture locally. Programs for 1940 models of other producers, thought to be nearing the release stage, are still being held in abeyance pending executive approval.

Machine tool representatives here report foreign business is holding its own as a major portion of current specifications, although little of this is transacted through local offices.

Russia, England, Japan and Italy are buying American machinery heavily, although in the last two months a change has developed in Russian buying. Equipment for Russia was formerly purchased through Amtorg Trading Corp. in New York but for some unexplained reason this business is now clearing through Stanko Export, also in New York. The only explanation heard here is that there may have been some "liquidation" of Amtorg personnel, resulting in the transfer of this lucrative business to another export organization.

■ CONSIDERABLE mystery surrounds the new Packard 6 model on which inquiries for a whole host of parts have been released for figures. Some inquiries are based on lots of 100,000 units which, in view of the fact total production of all Packard models in the boom-year of 1937 was about 112,000 units, would indicate some rather ambitious plans for the new lower-price model.

It is not believed any actual business has been placed for this new 6, and it may be that by the time all cost estimates are in, the project will be dropped or body building will be farmed out to an outside supplier. It is still a little early to make any definite statements on whether or not this new model will appear and how soon. Earlier forecasts that it would be on streets in January appear now to be somewhat over anxious.

Equally vague is the introduction date of the new Studebaker light and low-price 6 which is reported to be in the mill.

Just 35 years ago workmen were unloading the last of the machines to be shipped here from Warren, O., for installation in the completed plant of Packard where the original model L was about to be put in production. Total assemblies for that first year were 186, a volume which can be turned out now in less than half a day. Six men at Packard in 1903 continue in the company's employ, two of them having begun work in Warren in 1901.

General Motors has released its 1939 portfolio of models available from various divisions. The total for all models is 86, including nine business coupes, 13 sport coupes, ten convertible coupes, 13 two-door sedans, 16 four-door sedans, seven convertible sedans, 15 limousines with special bodies, and three station wagons. Delivered prices range from $628 to $7175, the latter a Cadillac 16 town car.

Chrysler is starting to publicize the new type of transmission to be used on its "custom imperial" model only. It is a hydraulic torque converter and will be termed the "fluid drive" and not the "fluid flywheel," the latter being a proprietary identification of the transmission used on Daimler cars in England. Technical details have yet to be released.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,130
Feb.	300,810	383,900	202,589
March	438,943	519,022	238,598
April	527,625	553,231	238,133
May	480,518	540,377	210,183
June	469,368	521,153	189,399
July	451,206	456,909	150,444
Aug.	275,934	405,072	96,936
Sept.	139,820	175,630	89,623
Oct.	230,049	337,979	215,296
Nov.	405,799	376,629	*390,000
11 mos.	4,097,316	4,669,088	*2,248,331
Dec.	518,958	347,349	.....
Year	4,616,274	5,016,437	.....

*Estimated.

Estimated by *Ward's Reports.*

Week ended:	1938	1937†
Nov. 12	86,300	85,325
Nov. 19	96,735	85,757
Nov. 26	84,930	58,955
Dec. 3	‡97,795	86,848
Dec. 10	100,705	85,765

†Comparable week.

	Week ended Dec. 10	Dec. 3
General Motors	41,840	‡43,905
Chrysler	26,950	25,270
Ford	21,125	17,850
All others	10,790	‡10,770

‡Revised.

■ LAST week's "love feast" of automobile executives with the national economic committee in Washington was in distinct contrast to usual appearances of business leaders at the nation's capital. Testifying on the automobile industry's patent procedures, Edsel Ford, Alvan Macauley, W. S. Knudsen, C. F. Kettering and others were all smiles, albeit somewhat nettled over the surge of newspaper and newsreel cameramen to snap pictures. Noting the discomfiture of Mr. Ford at the latter stage, one of the senators pointedly observed, "This helps to sell automobiles as well as politicians, you know."

Mr. Ford said his company owns 409 patents, has granted 92 free licenses to other companies to use its patents, has received 515 licenses from other companies, has been sued 60 times for patent infringement since 1926, has been threatened with suits 346 times, has 13 suits pending.

The patent policy of the automobile industry, since the practice of patent pooling was begun 20 years ago, has been such as to make it entirely free from intercompany litigation, as well as stimulating productivity and lowering prices. All motor manufacturers except Packard participate in the cross-licensing of patents.

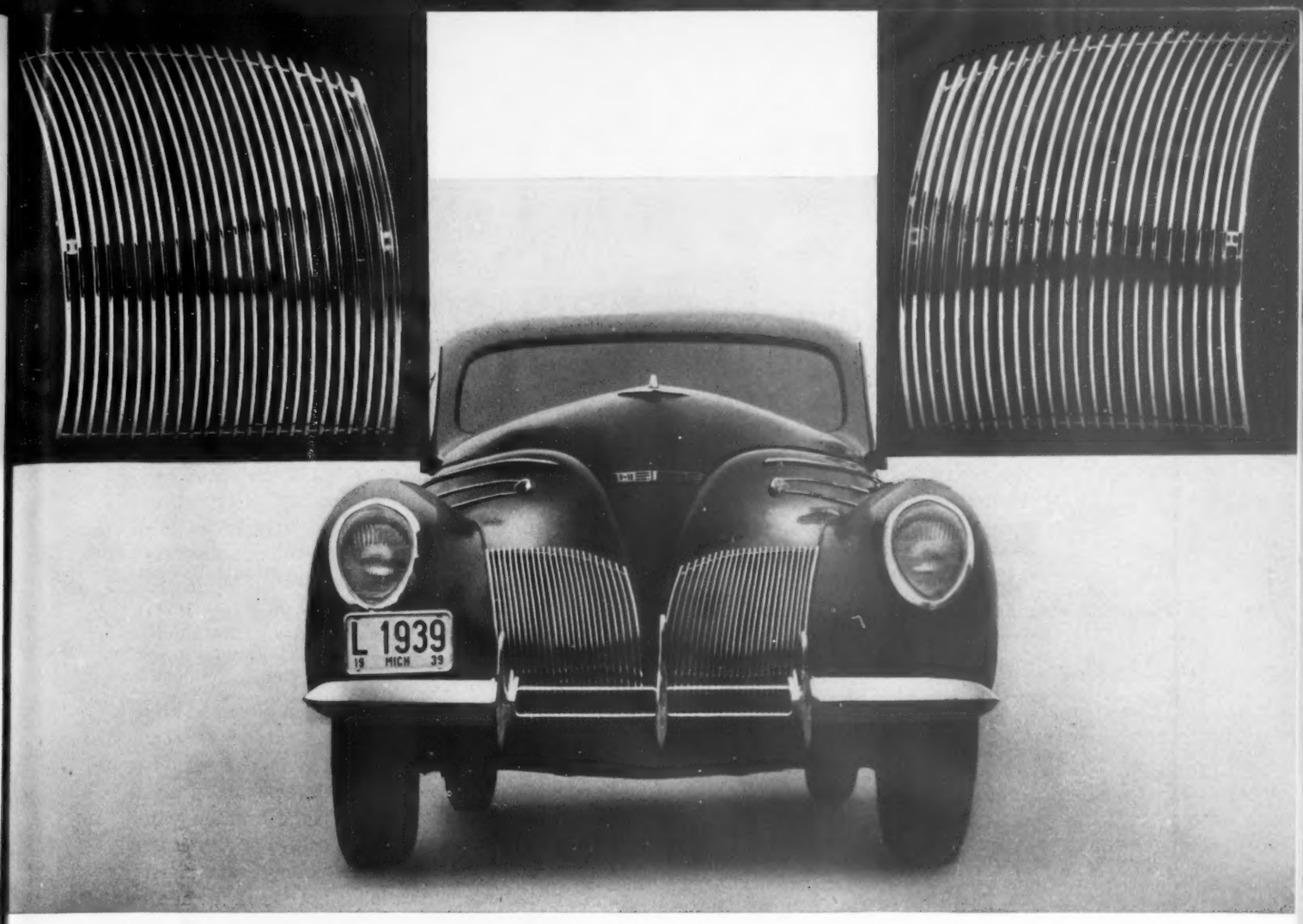
Testifying on the subject of profit-sharing, Mr. Ford pointed out his company has tried to avoid paternalistic schemes, believing that high wages are the best form of profit sharing. The company, however, has operated since 1920 an employes' savings plan, under terms of which an employe can invest his funds with the company at a guaranteed rate of interest (first 6 per cent, later 4½ per cent) plus special returns voted semiannually by the company. The latter have run as high as 10 per cent—definitely a form of profit sharing.

■ PLIGHT of the $12,000,000 tool and die industry of Detroit is ably portrayed in an article by B. Frank Hall in the *Michigan Manufacturer and Financial Record.* Observing that all tool and die shops have to sell their customers is skilled labor, he cites the records of three Detroit shops during 1936, 1937 and 1938:

	1936	1937	1938
	——Man-Hours Sold——		
Shop A	228,000	154,000	91,000
Shop B	138,000	120,000	33,000
Shop C	48,000	46,000	13,000

As pointed out in this department before, this 60-75 per cent loss is not occasioned by commensurate reduction in the amount of available business, but is attributable mainly to the wide disparity in wage rates between Detroit and other sections of the country. Outside of Detroit, in Ohio, Pennsylvania, and even in other sections of Michigan, wage rates are anywhere from 20 to 30 per cent under the $1.30 per hour base rate here. The problem seems to rest squarely with labor unions which now dominate tool and die workers locally.

■ Purchasing Agents' Association of Indianapolis announces its second annual purchasing agents' show, Feb. 14-17. The show will be held in the Manufacturers building, state fairgrounds. F. C. Thompson, Link-Belt Co., Indinapolis, is president of the Indianapolis association, and Dwight S. Ritter, 305 Merchants Bank building, Indianapolis, is chairman of the show committee.



A WHOLE INDUSTRY CAN'T BE WRONG

You are looking—head on—at an important 1939 automotive design trend—a trend which has captured almost the entire industry. The adoption of small, low mounted radiator grilles provides greater efficiency in air cooling and more freedom in front end design—ZINC Alloy Castings continue as the preferred metal and method of construction.

Ten of the fifteen makes of cars in the medium and high priced groups will have ZINC Alloy Die Cast radiator grilles in 1939. Do you know any other single production method which could provide the sharp, square-cut lines—the unusual contours—the unfailing accuracy of shape and dimensions which are demanded in present day grille designs? And do not overlook the inherent economies of ZINC Alloy Die Cast grilles—low die cost, plus low assembly cost through the ability to accurately tailor the casting to fit the car.

Radiator grilles have focused much attention on the die casting industry—because of the size and prominence of this ZINC Alloy application. But production men in many varied industries know that all of the advantages of ZINC Alloy Die Castings are not found in a radiator grille. If *you* are not acquainted with all of these advantages we suggest that you consult a commercial die caster, or write to The New Jersey Zinc Company, 160 Front Street, New York City.

ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

EDITORIAL

Cost of Reporting Is Too High

■ FOLLOWING is an abstract of an article in a recent issue of *Forbes* which presents the first overall picture of the burden that is sustained by business in filing reports to government units, federal, state and local:

In ten years the number of government reports the average company has to file each year had pyramided 865 per cent and the cost of filing them 440 per cent. Many companies intimated they spend more time and money filling out government forms than they do in conducting their own business.

Ten years ago 27 companies submitted 259,749 reports, an average of 9620 per company, and 21 of these companies paid $477,653, or $22,745 each, for the privilege of doing so. Today 67 companies file 6,217,972 reports annually, an average of 92,806 reports per company, and it costs 54 of these companies $6,630,803, or $122,-793 each, to do so.

A food products company estimated it must file 510,000 reports yearly. A New York City bank counted up 280,000, a meat packer 141,628, a public utility 75,000, a railroad 102,360. To an oil company fell the distinction of filling out the greatest number of reports annually. It compiles 1,135,-000 reports at a cost of $1,250,000.

Duplication and Complication Twin Evils in Statistical Burden

What are these reports? They may include information returns on employe income, quarterly reports on individual employes to the social security board, reports to state unemployment-insurance funds, tax returns, SEC reports and innumerable other regular and special reports required by departments, commissions and bureaus of federal, state and local governments.

What's wrong with the government statistical setup? In general, two things: Duplication and complication.

There is duplication, for instance, in the social security and income tax reports; both require much the same information, though the former reports are filed quarterly and the latter yearly. If the social security board were to modify its reporting requirements from a quarterly to an annual basis, the income tax and social security reports could be combined into one, or a carbon copy would serve either purpose. It is computed that the number of statistical returns now filed annually would be halved by such procedure.

Should such a modification be made, and should the central statistical board now studying government reports suggest effective remedies for their complexity and duplication, says *Forbes,* the problem will be far from solved. The deluge of new laws affecting business is not yet over, and much of the new legislation is apt to call for additional reports. Too, the central statistical board can concern itself directly only with federal agencies. Thus states and municipalities would be free to go on requesting as much information from businessmen as they wish—unless induced to do otherwise.

Expense of Compiling Data Must Be Paid by Consumer

Industry has sound arguments for proving that the present complicated reporting system is not in the public interest. Money expended on such reports is not spent productively but must be added to cost of production and, consequently, to the consumer's buying prices. By raising its voice, industry may be able to convince our lawmakers that something can be done to relieve it of much of this great burden. The fact that the necessity for all these reports has quite a bearing on the average employer's willingness to provide employment to additional workers can be thoroughly emphasized in this connection. Following the unmistakable manifestations at the recent elections that the general public is in favor of more sympathetic treatment of business by government, an aggressive approach on this problem at this time should be productive of results.

THE BUSINESS TREND

Activity Index Recovers Most of Holiday Loss

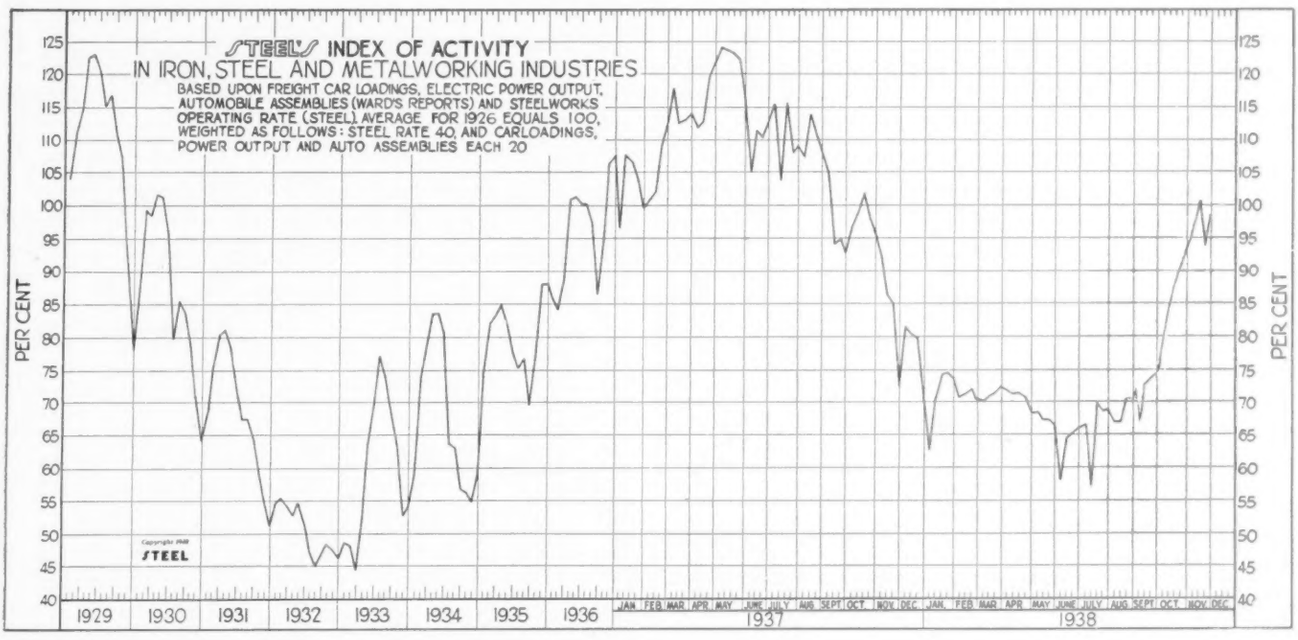
■ THE expected gains in industrial activity from the recent holiday interruption is reflected in STEEL'S index of activity for the week ended Dec. 3. The index now stands at 100.1 per cent, a gain of 6.2 points over the preceding week and remains well above the corresponding week last year of 81.5 per cent.

The steelmaking rate was the only one of the four barometers composing STEEL'S index which did not advance in the week ended Dec. 3. Reflecting the usual leveling off in demand as the year draws to a close, steelworks operations declined 1 point for the second consecutive week to 61 per cent. The fact that producers are rapidly clearing the books of the low priced flat-rolled tonnage placed during October is another important reason the national steel rate has eased in recent weeks.

Automobile output moved ahead to a new 1938 peak of 98,695 units in the week ended Dec. 3, thus recording the expected sharp upswing from the preceding holiday week total of 84,930. A year ago automobile assemblies were placed at 86,173. Still further rise in motor car production is anticipated for the week ended Dec. 10. Preliminary estimate of motor car output of 372,000 in November, represents a slightly lower volume than the 376,629 cars produced in November, 1937.

Revenue freight carloading for the week ended Dec. 3 are estimated at approximately 640,000. This is a gain of some 80,000 cars over the holiday week total of 562,084, and also exceeds the 623,337 cars loaded in the identical week last year. The peak this year in revenue freight carloadings occurred in the week ended Oct. 15 when loadings totaled 726,612 cars. Electric power consumption in the latest week touched a new high for the year. Power output of 2,285,523,000 kilowatt-hours in the week ended Dec. 3 represents a marked gain over the 2,183,807,000 kilowatt-hours recorded in the holiday week and exceeds the former peak this year of 2,270,296,000 kilowatt-hours in the week ended Nov. 19.

The leveling off of activity in some industrial lines in the closing weeks of the year is considered only a normal seasonal tendency, particularly since commodity prices are showing no signs of advance. The general increase in total payrolls, together with anticipated larger government expenditures through the medium of building construction and other channels, is one of the stimulating


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100, WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40
1929 1930 1931 1932 1933 1934 1935 1936
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 1937
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 1938
STEEL

STEEL'S index of activity gained 6.2 points to 100.1 per cent in the week ended Dec. 3:

Week ending	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Aug. 27	70.3	108.5	94.0	77.3	60.3	71.6	45.2	66.5	87.4	116.9
Sept. 3	72.3	104.8	87.5	70.9	55.1	70.3	45.4	65.3	79.0	106.3
Sept. 10	66.8	94.3	83.1	70.1	53.5	65.5	44.9	60.9	85.9	114.0
Sept. 17	72.9	95.0	90.1	69.4	58.7	69.1	47.8	65.6	86.2	112.2
Sept. 24	74.0	93.0	86.2	68.5	58.1	68.2	48.0	65.2	83.8	110.7
Oct. 1	74.9	96.6	89.0	73.3	59.3	66.9	47.7	62.4	81.0	109.1
Oct. 8	78.9	99.0	93.4	74.9	54.7	67.4	48.4	61.5	79.4	108.2
Oct. 15	84.3	101.8	95.5	77.4	56.4	66.0	48.7	57.9	77.5	106.1
Oct. 22	88.7	97.5	97.1	82.4	58.2	60.9	48.7	58.2	77.4	104.8
Oct. 29	91.4	95.7	99.1	86.4	56.3	58.0	48.3	55.9	72.5	102.5
Nov. 5	93.4	92.3	102.1	88.4	55.0	52.3	48.5	56.6	71.5	98.1
Nov. 12	95.9	86.5	107.9	88.8	54.9	50.7	47.7	55.5	73.0	91.6
Nov. 19	100.4	84.9	109.9	90.9	55.2	52.6	49.2	54.8	71.0	87.8
Nov. 26	93.9†	72.7	105.2	86.0	54.4	55.4	44.5	51.4	66.9	80.9
Dec. 3	100.1*	81.5	108.4	91.7	51.9	49.7	45.3	52.5	69.2	85.0

*Preliminary. †Revised.

forces which may help to sustain the recovery movement in coming months. The rather surprising acceptance of the new auto models and the encouraging outlook for this industry is another important factor in the belief of a healthy resumption of business improvement after the first of the year.

FOREIGN TRADE GAINS SEASONALLY

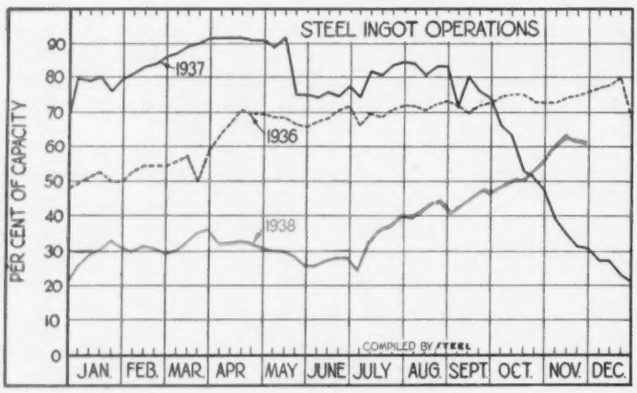
Following the customary seasonal course, foreign trade rose in October to almost the highest level of the year. Exports did reach a peak, but imports were second to January. The combined total of exports and imports was also slightly below the January aggregate. Value of merchandise shipped abroad during October was $277,928,000, against $246,305,000 in September. Imports during October were valued at $177,979,000, compared with $167,653,000 in September. Export excess in October was $99,949,000. The balance of exports in the 10 months of 1938 of $960,131,000 compares with a similar balance of $59,322,000 in the same period of 1937.

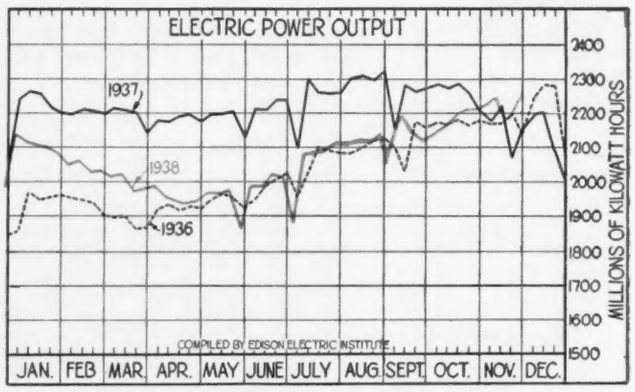
PIG IRON OUTPUT UP 14.3 PER CENT

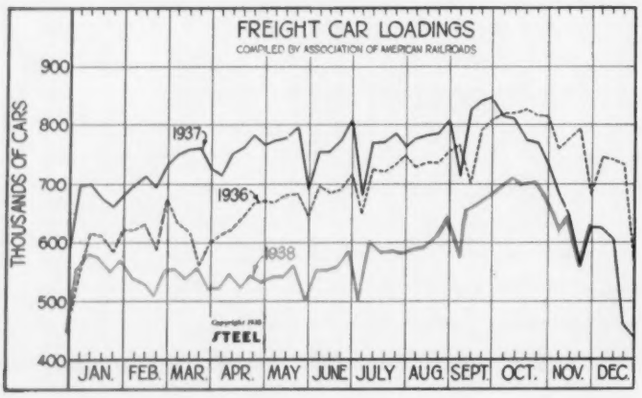
Average daily coke pig iron output in the United States in November amounted to 76,218 gross tons, a gain of 9524 tons over the October rate of 66,694 tons. This was the highest daily output since October last year. November daily average production a year ago was 66,901 tons. One merchant stack and one steelworks furnace were blown out last month. However, nine merchant furnaces were added to the active list, bringing the total to 121 furnaces active at the end of November. Low point of the year was in June when only 67 furnaces were active. Relating production to capacity, operations in November averaged 55.0 per cent against 48.0 per cent in October and with 49.3 per cent in November, 1937.

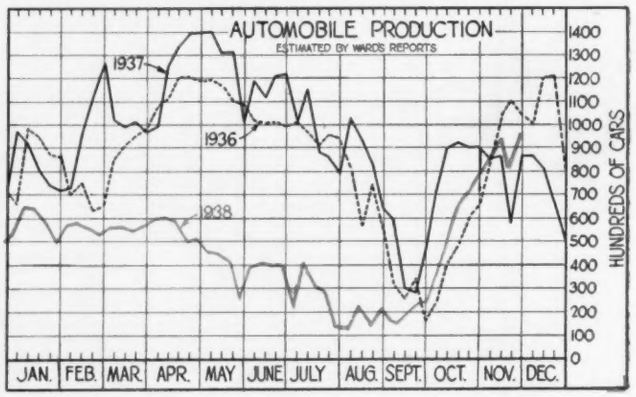
INGOT OUTPUT REGISTERS SUBSTANTIAL GAIN

Average daily ingot production in November totaled 137,393 gross tons, according to the American Iron and Steel Institute. This compares with 119,921 tons in October and with 86,151 during November a year ago. Total production of 3,572,220 tons last month represents an increase of 14.6 per cent over the October volume of 3,117,934 tons. Output in the first 11 months this year totaled 24,696,092, a decline of 48.6 per cent from the 48,045,241 tons produced in the corresponding period of 1937. During November ingot operations averaged 62.05 per cent of capacity, against 52.45 per cent in October and with 38.23 per cent in November, 1937.



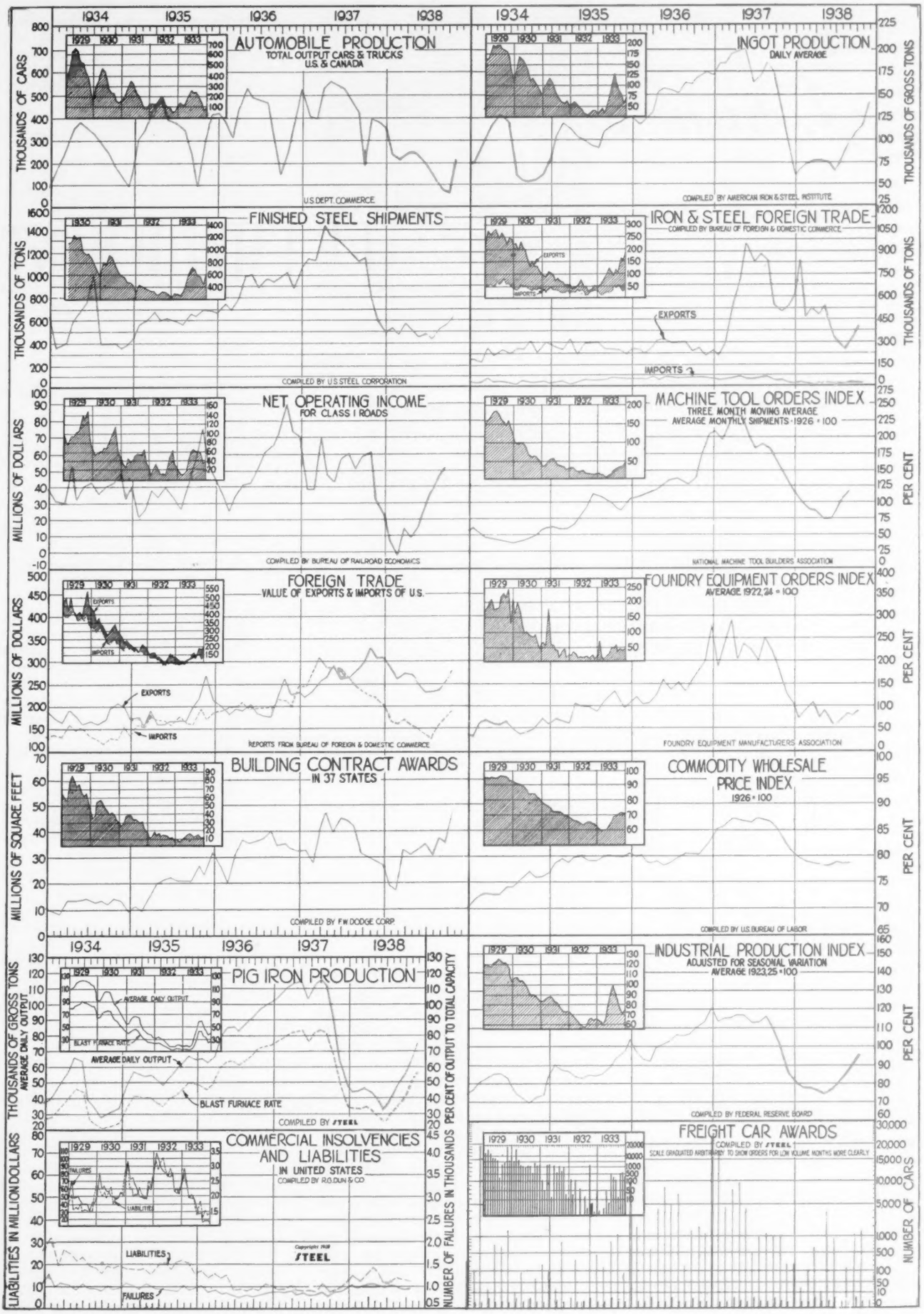




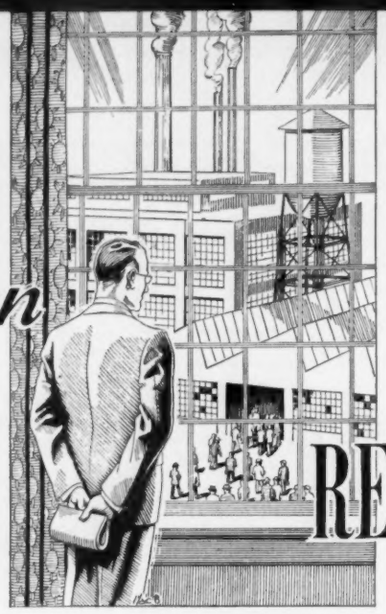


Week ending	Steelworks Operating Rate Per Cent 1938	1937	1936	Electric Power Output Million KWH 1938	1937	1936	Freight Car Loadings 1938	1937	1936	Weekly Auto Output 1938	1937	1936
Aug. 27	43.5	83.0	73.0	2,134	2,294	2,135	620,511	787,373	753,742	18,700	83,310	53,937
Sept. 3	44.5	83.0	71.5	2,148	2,320	2,098	648,039	804,633	764,680	22,165	64,200	31,628
Sept. 10	41.5	72.0	69.5	2,048	2,154	2,028	568,887	711,299	699,859	17,485	59,017	26,750
Sept. 17	46.0	80.0	72.5	2,214	2,280	2,170	660,142	826,565	789,510	16,100	30,150	33,165
Sept. 24	48.0	76.0	73.0	2,154	2,265	2,157	675,553	840,446	807,070	20,390	28,030	15,680
Oct. 1	47.0	74.0	74.5	2,139	2,275	2,169	697,938	847,245	819,126	25,405	45,830	22,800
Oct. 8	48.5	66.0	75.0	2,154	2,280	2,168	702,964	815,122	820,195	37,665	71,958	39,945
Oct. 15	51.5	63.0	75.0	2,182	2,276	2,170	726,612	809,944	826,155	50,540	89,680	48,195
Oct. 22	51.5	53.0	73.0	2,214	2,281	2,166	705,628	773,353	815,972	68,360	91,905	59,740
Oct. 29	54.5	51.0	73.0	2,226	2,254	2,175	708,840	771,655	814,175	73,335	90,155	66,985
Nov. 5	57.5	47.0	73.0	2,207	2,202	2,169	673,333	732,145	759,318	80,030	89,770	84,305
Nov. 12	61.5	39.0	74.0	2,209	2,176	2,169	636,710	689,614	784,672	86,300	85,325	104,248
Nov. 19	63.0	35.0	74.5	2,270	2,224	2,196	657,477	647,251	790,500	96,735	85,757	110,160
Nov. 26	62.0	31.5	75.5	2,183	2,065	2,133	562,084†	558,627	679,984	84,930	58,955	104,283
Dec. 3	61.0	30.5	76.5	2,285	2,152	2,243	640,000*	623,337	744,957	98,695	86,173	100,395

*Preliminary. †Revised.


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT. COMMERCE
THOUSANDS OF CARS
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
THOUSANDS OF TONS
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
THOUSANDS OF TONS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MILLIONS OF DOLLARS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
EXPORTS
IMPORTS
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
MILLIONS OF DOLLARS
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
PER CENT
BUILDING CONTRACT AWARDS
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
MILLIONS OF SQUARE FEET
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PER CENT
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
PER CENT
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
FAILURES
LIABILITIES
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS
Copyright 1938 STEEL

Forum on RE-EMPLOYMENT



■ AS LONG as ten million idle employables clog the American industrial system, there can be no real prosperity in this country. As long as this condition exists, evils that spring out of it will be with us—including reduced public purchasing power, high taxes, the unbalanced budget and unwise regulation.

To the solution of the fundamental problem, STEEL dedicates this Forum on Re-employment. In it, week by week, leaders in the metal producing and metalworking industries will present their views as to what must be done to the end that employers promptly may provide jobs at fair compensation to all who are able and willing to work. The result, it is hoped, will be a clarification of current thinking along these lines.

In this introductory discussion, W. E. Whipp, president of the National Machine Tool Builders' association, advocates freeing of the flow of capital into small industries, adoption of a tax system that will encourage expansion, and removal of present legislative hurdles. He emphasizes that shorter hours and higher wages are deterrents to re-employment.

Other factors vital to early and widespread re-employment will be discussed by other industrial leaders in subsequent issues.

—The Editors

■ WHEN industry is able to absorb into its economic structure—profitably and at fair wages—its share of the employable manpower of the United States, then and not until then will present problems involving excessive taxation, unbalanced budgets, over-centralization of government and curtailed purchasing power of the individual, be solved. In other words, unemployment itself is the biggest problem facing us today.

It is not too much to say that industry's own future and the future of the American system of government and of free enterprise, and the individual welfare of the average American, depends upon its solution. Relief and "made work" through government agencies obviously are no answer. What then can the business man do about it, and what must our government do to make it possible for American industries—the heavy industries in particular—to get the maximum number of people back to work in the shortest possible time?

As a builder of machine tools, which—as the "master tools of industry"—are an important part of the foundation of our industrial structure, I have given these subjects of unemployment and re-employment long and serious thought, both as they affect my own company and its markets and as they affect the whole capital goods industry. I have some definite ideas on what can be done and what must be done by industry toward the wiping out of unemployment. I also have some very definite ideas as to why industry has not yet been able to do more in this direction.

In all fairness to industry let me say that just as soon as certain obstacles are removed, a prompt and substantial improvement will follow. One of the most absurd ideas that ever got into print was the suggestion that business men are willing or able to create or prolong a depression in order to discredit the policies of the government.

The major obstacles that face us can be divided roughly into two classifications. First, there are those factors which deter investment and speculation. I use the latter term in its best sense—for without renewal of capital in existing industries, and without "risking" of capital in new industries, there can be no solution of our unemployment problem. Second, there are those hasty and artificial laws and regulations which have plunged our labor situation into uncertainty, thus rendering an adequate return on investment doubtful indeed.

Obstacles Surmountable

The outlook is not hopeless, because these obstacles are artificial and unnecessary and they can be removed. I am convinced that we have learned the unmistakable lessons of the past six years and are now ready to take the steps that will clear them away.

Three times since 1932 we have seen a recovery lapse into a recession, before the nation's employable working forces had all been called back to their jobs. Each time the fault lay in failure of some part of the durable goods industry. Many of the millions of men and women directly dependent on that industry were given no opportunity to work and a still greater number who might have been employed in service industries—had there been real revival in the durable goods industry—also were left idle. All this has happened despite the fact

that the genius of our inventors has given us methods and materials far ahead of the best available in any other country, and despite the fact that these men and women are anxious to go back to work.

The frequency and extent of the recessions during a period when every agency of our government has been directing efforts toward improving the position of all classes of labor, point to some common cause that has prevented that "final push" which—as recovery gained strength—should have carried it to the sustained prosperity that attends full production. Where shall we look for that cause?

Throughout our country people are gradually awakening to the realization that the outpouring of public money (collected as taxes from those who can pay) to those who are not profitably employed, serves only to stimulate purchase of day-to-day necessities in those sections where most of the beneficiaries reside. While it may aid in some consumer goods industries for the time being, this procedure builds nothing that is enduring. As a means for alleviating distress, such efforts may sometimes be commendable but the idea that we can rely on them to restore prosperity has by now been thoroughly disproved.

"Spread-work" panaceas that attempt to limit hours of work without proportionately reducing earnings, have precipitated labor controversies which have seriously reduced production. They have increased manufacturing costs beyond the consumer's willingness to pay for the product. A still worse effect has been to divert attention from production, and to place the emphasis on the hourly wage rate rather than the amount and quality of goods produced. After all, production is the sole excuse for employing labor. Whether this is only a temporary effect remains to be seen. Much depends upon the attitude of the administrators of the various laws, state and national, now accumulating on the statute books, which deal with wage rates and hours of work.

Artificial Measures Fail

Government economists are beginning to recognize that all of the efforts made to stimulate recovery through higher wages and shorter hours, as well as huge governmental expenditures for public works projects, have failed to put back into active production those industries that produce the capital goods of our country. Labor Commissioner Isadore Lubin, speaking before the Monopoly Investigation committee at Washington on Dec. 2, named the durable goods industries as the chief contributors to the depression since 1929. His statement was an admission that at no time during this decade has there been sufficient incentive to investors to provide new equipment needed to increase production of all kinds of goods up to the rate necessary to bring this country's potential working force back into full-time employment.

We need to reverse this situation, and that will require the fullest co-operation between government, industrial management and labor. At the outset, there must be complete appreciation of the needs of industry for new capital to put into buildings, machinery and equipment to compensate for obsolescence, wear and decay of years of inactivity and to improve the quality of their products to meet the demands of today. No producer

W. E. Whipp
President, Monarch Machine Tool Co.
Sydney, O.

can continue to provide full employment if his equipment has become obsolete or is inadequate for economical production. He soon will be outdistanced by better equipped competitors, both in quality and cost of product, and the moment he thus loses his market, his employes' security in their jobs likewise is lost.

The first requirement for recovery then is a free flow of investment funds. That will come only with return of confidence in the safety of the principal and the assurance — or at least the hope — of a fair return on the investment. Unreasonable restrictions on bank loans and on the sale of securities, and interest rates too low to be attractive, both are deterrents to speculative enterprise. They discourage industries already established and prevent creation of new enterprises. They weigh most heavily on companies of small and medium size, which in the aggregate are of great importance in our industrial structure.

The second requirement is freedom from unreasonable and punitive taxes. Such taxes likewise discourage investment in business enterprises which would provide additional employment opportunities. The present tax policy is doubly harmful, in that it not only penalizes ingenuity and thrift, but also — by driving available funds into the seclusion of tax exempt securities — actually reduces the dollar volume of revenue otherwise obtainable.

Labor's Responsibility

The third requirement is a higher sense of responsibility on the part of labor to give a full day's work for a full day's pay. No one will question seriously the ability of industry to produce goods in sufficient volume, and of such quality and price, as will step up the standard of living of every one of the thirty thousand families in this country. To bring about such a desirable state of affairs, however, all factors involved must work in harmony. Manufacturers must be assured a reasonable opportunity and must be given incentive to provide proper equipment for production. Labor must be willing to fulfill its responsibilities to work diligently, to develop skill and to avoid waste on the job. Service industries, both through their management and labor, must be willing to contribute their services at costs that will make possible distribution of the goods without raising their price out of reach of the buyer.

Laws that place a premium on labor discussions, complaints and controversies naturally result in shut-downs, strikes and that more insidious and far more serious source of loss — the breakdown of morale. Laws that result in lower output at increased wages also increase costs and selling prices, thus leading to more unemployment. New rights and privileges have been placed in the hands of labor—some of them only just and fair. At the same time new responsibilities have been placed on the shoulders of the employer — some of them outrageously unfair. Because a single house was on fire the fire department has entered every house in the neighborhood and has flooded them all, with cheerful impartiality. In other words, the occasional unfair employer has been the excuse for a broad attack on all industry.

Remove these restrictions; restore confidence so that every citizen can save and invest with expectation of a reasonable return for his thrift; put the huge capital resources of this country back to work toward the goal of producing more and better goods salable at prices that all can afford to pay; and the painful condition of long drawn-out, involuntary unemployment soon can

(*Please turn to Page* 81)

Lubrication

Due to exacting demands imposed by high pressures, temperatures and ever-present exposure to contamination, lubricating arrangements must be most carefully designed. Several typical systems are described

Part I

■ MODERN strip mills place a direct responsibility upon the lubricating engineer, not only in his original selection of lubricants, but in his study of mechanisms to apply them most positively.

Lubrication here has to do primarily with bearings and gears exposed to high pressures, high temperatures and contamination of lubricants by water, scale and dirt.

Today improved types of bearing design, systems for automatic handling of lubricants, oil-tight gear housings, precision roller bearings, and special lubricants greatly aid lubrication.

Modern finishing mills operate continuously in the same direction. They include all the necessary stages whereby rails, plates, strips, sheet and structural shapes are produced. When designed for high-speed service the slabs may go through under one heat.

More frequently, however, the steel must be reheated before it passes to the roughing stand, so it is delivered to a charging machine which feeds these slabs to the reheating furnace. After being raised to a red heat they are discharged to the run-in table of the roughing mill. This gives the first reduction in size. It takes place just after the slab has passed through a set of preliminary edger rolls. During these two passes a considerable volume of water at high pressure is blown over the steel to wash off the scale.

Pinion and roll neck bearings, as well as edger gears, are obviously subject to some of this water, especially if they are not carefully housed. In case of the latter, the respective lubricants will probably be contaminated, not only with water, but also with some scale. Builders of both rolling mills and lubricating systems have appreciated this, and observe every precaution to prevent such leakage by using the most modern types of seals.

A set of edger rolls is usually installed just preceding each roughing stand. In the strip mill, strip is then subjected to a series of continued reductions by successive rolling through a number of finishing stands until it reaches the coiler which automatically rolls or coils the strip. Rails, structural steel and plates, however, must be cut by saws to facilitate handling; bars, rounds and flats, in turn, being cut by flying shears. Here transfer tables are involved.

Coiler Bearings Protected

The coiler unit comprises a rotating member surrounded by segments containing two guide rolls each. These rolls are carried on roller bearings which are lubricated by grease. Protection of these bearings is important due to heat retained by the strip, and the flood of water which deluges the coil during winding. The problem, however, is not so much to find a suitable grease, as to protect the distributing pipes against the flapping end of the strip as each coil completes its winding and is discharged from the machine. A good quality lime soap grease containing about a 1100/1200 S.U.V. oil performs satisfactorily if fed through brass delivery pipes which can be more or less molded to the end surfaces of the roll segments and thereby kept away from the end of the coil; guards are not entirely dependable as they are too easily knocked off.

Paralleling the development of the continuous strip mill has been the development of two widely different types of bearings for roll neck service. These are the heavy-duty roller bearing and the flood-lubricated sleeve bearing.

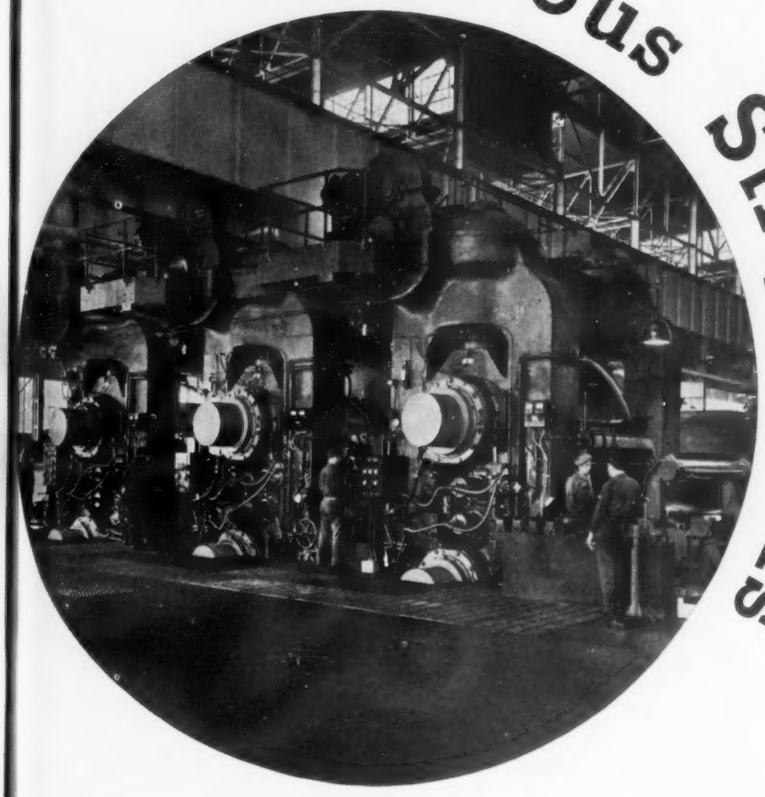
When roller bearings were first used on roll necks of 2-high mills, they were of necessity limited to light load service, for in order to provide space for the installation it was necessary to reduce the diameter of the roll necks to such a point that bending became a factor. This affected the life of the bearing and roll neck and resulted in high maintenance cost.

With advent of 4-high mills, however, and the heavier rolling pressures that resulted, bearing designers gave more thought to load-carrying capacity. Larger diameter of rolls and greater difference in diameter between necks and roll barrels offered an advantageous point of application for the roller bearing.

In the beginning such bearings were applied to both work rolls and back-up rolls, and many engineers

Abstract from "Lubrication," published by The Texas Co., New York.

In Continuous Strip Mills



used oil for their lubrication. Today, however, the roller bearing is widely preferred for the work rolls with a centralized greasing system for lubrication. Then came the demand for a grease having extreme pressure characteristics which could be pumped through long lines even under low atmospheric temperatures. The modern E. P. grease has evolved, capable of withstanding severe loading without separation and able to seal the bearing against water, scale and mill dust.

One of the most prominent of the recent advancements in the lubrication of steel mill machinery has been the development of centralized greasing systems involving positive delivery of measured quantities of grease at periodic intervals, the exclusion of non-lubricating foreign matter; economy of lubricants, minimum hazard in handling or filling, and remote control.

There are a number of ways by which the lubricant can be controlled and impelled to the various points of delivery. Where positive piston displacement types of metering valves are employed at each point to be lubricated, hydraulic power is especially adaptable as a means of valve control. In such a system designed for table rolls, and the bearings of the coiler and other heavy duty machinery, either one or two lubricant supply lines can be connected to each valve according to the nature of the service.

Where two lines are employed, pressure is applied alternately, each line receiving pressure over a prescribed period during which this line discharges each of the valves. The time between pressure applications will serve as the time interval between operations of the system.

In the single line system, the required grease pressure is developed by using hydraulic fluid for transferring the power from the electric motor to the grease pump itself. By employing a large piston, subject to very slow motion, a considerable quantity of grease can be handled, air pockets are effectually eliminated, and the system gives long and satisfactory service.

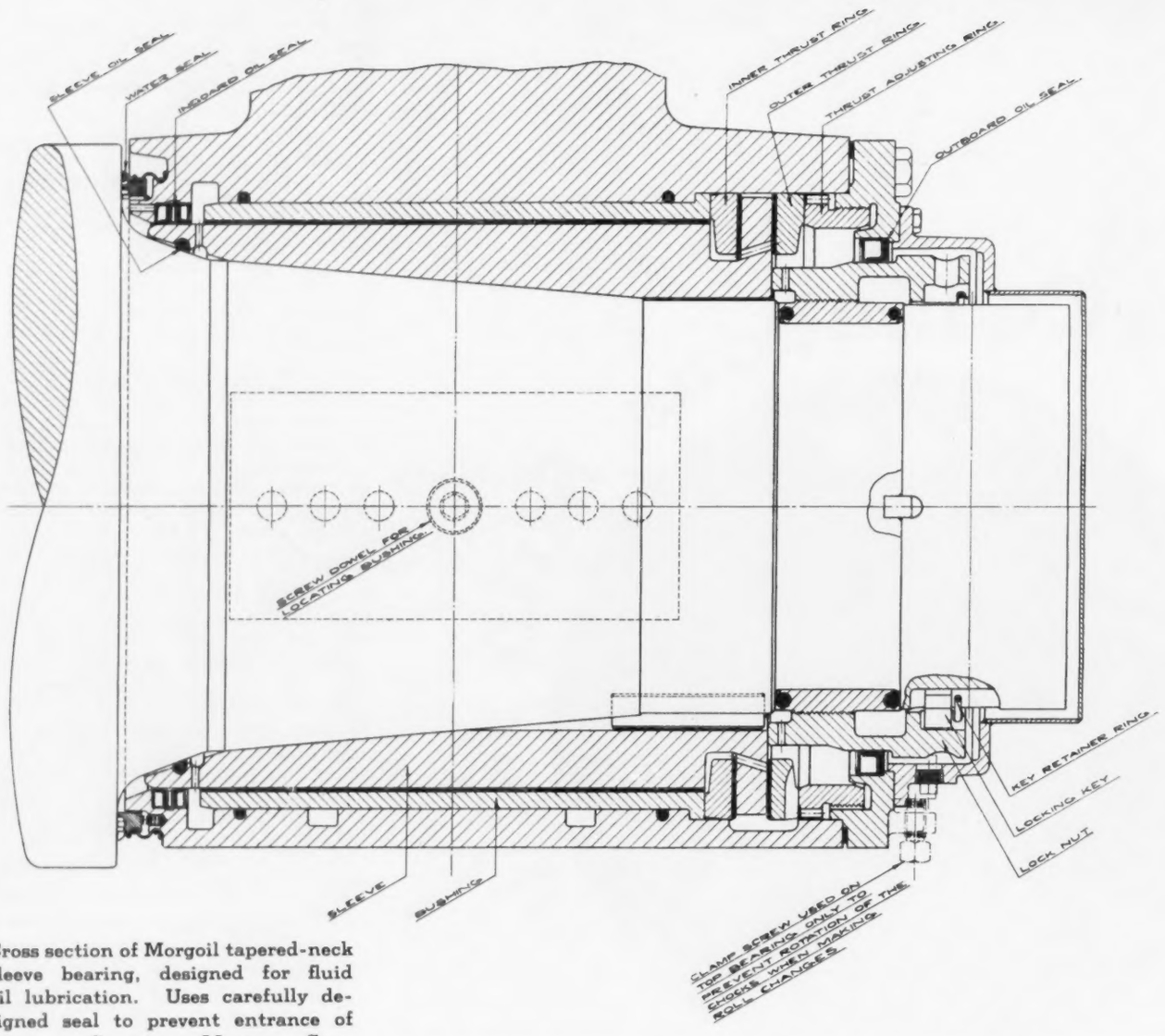
In studying grease lubrication as applied to the modern continuous mill, an understanding of the basic principles of roller bearing design is important since this is the type of bearing chiefly employed.

For a roller bearing to function as intended each roller in the assembly must be set with its axis absolutely parallel to the axis of the rotating shaft. Under such a condition the contact area is rectangular. This must be maintained if the bearing is to continue to operate successfully. Any variation in parallelism, due to skewing of a roller will lead to alteration of the rectangular contact area of rollers on the shaft. It becomes a function of the designing engineer to provide against skewing by planning his roller guides accordingly. This becomes more difficult as rollers are increased in length or possess a greater diametric difference with respect to their races.

Roller bearing guiding requires careful attention to lubrication wherever steel-to-steel rubbing surfaces are employed. Positive circulation or transmission of lubricant over these surfaces must be assured if the guides are to function as intended, in maintaining roller alignment.

Special Oils Needed

The perfection of the oil-lubricated, sleeve-type bearing led to the requirement of specialty lubricating oils of turbine grade to meet the fluctuating speed, load and water conditions. The advantages incident to continuous circulation of comparatively fluid oils were immediately obvious with this development and the design of lubricating systems capable of serving both gears and bearings with the same oil. Installations of this type are comparable to the steam turbine, involving operating conditions which require oils of similar characteristics, though usually of heavier body. .When the sleeve-type, flood lubricated bearing was first adapted to roll neck service the requirement for resistance to emulsification or high demulsibility was far more pertinent than it is today, for the construction of these bearings could not, at that time, positively assure against the entry of water. Later designs, however, by making use of specially designed seals, have materially reduced the possibility of water contamination. Tight fitting brass rings, leather cup seals or rubber are all used, according to the design of the bearing. It has been found good practice to install leather cup seals in pairs back-to-back, so



Cross section of Morgoil tapered-neck sleeve bearing, designed for fluid oil lubrication. Uses carefully designed seal to prevent entrance of water. Courtesy Morgan Construction Co., Worcester, Mass.

to speak. The result of this attention to design has reduced the severity of service and become a definite assistant to lubrication in enabling the oil to function free of possible emulsification and reduction in lubricating value.

When viscosity was first considered as a specification for oils for such service, the viscosity index seemed quite important, as it denoted the slope of the viscosity-temperature curve. When observed over the relatively narrow range of operating temperatures within which many oils in a circulating system must function, the difference in operating viscosity is very slight.

It is today more important to consider the demulsibility, the viscosity with respect to speed, and the chemical stability.

In the operation of a gravity oil circulating system, the supply pump delivers oil from the settling or sump tank to an overhead supply tank which is mounted high enough to give ample pressure to the gears and bearings. An oil overflow line from the overhead tank to the sump tank returns all surplus oil delivered by the pump. From this overhead tank a supply line delivers oil by gravity to the various points of lubrications; the oil then returns by gravity to the sump tank located below the operating floor.

Gravity circulation is simple and no doubt does reduce the intricacy in construction and the necessity for costly automatic controls, but it is limited in regard to available pressure due to plant conditions. Where this pressure is low it may influence the choice of the viscosity of oil which should be used in particular instances.

Normally, with increase in pressure, the viscosity can be somewhat reduced. This reduction in body of the lubricating oil is compensated for by the added volume which becomes available through the increased pressure under which the oil is delivered.

Full pressure method of lubrication is widely used for the lubrication of gear units and oil film bearings because of its pronounced flexibility. In this system the supply pump delivers oil at a predetermined pressure from the settling tank to a pressure tank in which an air cushion is provided at the top.

Expansive action of the air cushion in the pressure tank forces the oil through the main supply line and numerous branch lines equipped with orifice plates or valves to provide each bearing or gear unit with its proper share of lubricant. Frequently each of the various points of lubrication is equipped with a pressure switch and light signal to warn the operator should the oil flow be interrupted.

An oil cooler of ample size is provided to lower the temperature of the oil leaving the pressure tank. For best results an ample supply of cooling water must be provided for the cooler and the latter must be kept clean. Thermometers inserted in the oil lines entering and leaving the cooler serve as indi-

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GULF'S *higher quality lubricants to reduce operating costs*

A famous fact-finding organization recently asked several hundred industrial oil buyers this question: "What considerations led you to purchase the brands you are now using?" A few said "price," *but a great majority answered* "QUALITY."

There is just one fundamental reason why an increasing number of plant operators are buying lubricants on a quality basis. It is this: *Proper lubrication has a far-reaching influence on the important costs of plant operation.* When plant men learn how good oils and greases can help them improve production, reduce maintenance costs and cut power bills, they demand lubricants of highest quality to help them operate on a profitable basis.

That is why a versatile group of highly skilled technical men works each day in the Gulf Laboratories to perfect better lubricants — to raise the quality standards for oils and greases. Through their unceasing efforts, Gulf is able to offer industry a complete range of more than 400 oils and greases of highest quality. These finer lubricants are helping hundreds of plant managers operate their machinery more efficiently.

There is a *real quality story* behind Gulf oils and greases. Let a Gulf engineer demonstrate to you — in your plant — how Gulf's higher quality lubricants provide a greater measure of protection for your machinery and help you reduce the costs of plant operation. Gulf Oil Corporation — Gulf Refining Company, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

cators as to the efficiency of the cooler.

Pressure filters installed between the pumps and the pressure tank remove any foreign matter that might remain in the oil drawn from the settling tank. Filters of the latest design have a self-cleaning feature which requires very infrequent dismantling for the removal of the collected foreign matter from the filtering medium.

Cleaned by Centrifuges

Many circulating systems will include one or more centrifuges which are usually operated intermittently for an hour or so each day. Where large quantities of water may get into the system, however, the centrifuges are sometimes run continuously until the source of the water can be found and the leak corrected.

With the possible exception of the circulating pumps, the settling tanks are the most useful and necessary features of the circulating system. Where there is any chance of considerable water getting into the system it is advisable to install two settling tanks, so when the oil in one tank shows signs of emulsification the contents can be taken out of service for reconditioning.

Oil is heated by steam coils located in the bottom of the tank to a temperature sufficient to reduce the viscosity and enable the entrained water to settle to the bottom from whence it can be drawn off through drain valves. It is desirable to slope the bottom of the tank toward the front; then by periodically opening the drain valves, the accumulation of water and sludge in the tank can be held to a minimum. Floating suctions also are often installed to allow the pumps to take the cleanest oil which is found near the surface of the oil in the tank.

Relative fluidity, as measured by the viscosity and pour test, must always be carefully considered, especially at low temperatures; it becomes highly important in conjunction with the pressure available.

The pour test used to require particular consideration, for in cold weather or under low temperature starting conditions in exposed mills, the rate at which the oil could be returned to the settling tanks was affected. Should it become too sluggish at any time, flow off from a pinion housing or bearing might be impaired to develop backing up of the oil in the system. Furthermore, if any bearings were improperly sealed, oil might leak from the case. This would result in waste and a sloppy condition on the operating floor.

(Concluded next week)

Pygmy Encyclopedia for The Executive's Pocket

■ *Executive's* 1939 *Data Book*, fabrikoid, vest-pocket size; published by Prentice-Hall Inc., New York; supplied by STEEL, Cleveland, for 75 cents; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S. W. 1.

In addition to diary pages for the full year this small volume contains a complete miniature atlas of the world, United States travel guide with population, hotels and railroads of principal cities and towns, income tax information, and various statistical data. A perpetual calendar, from 1700 to 2100, is included.

Load Brake and Gears Air Cooled in New Hoist

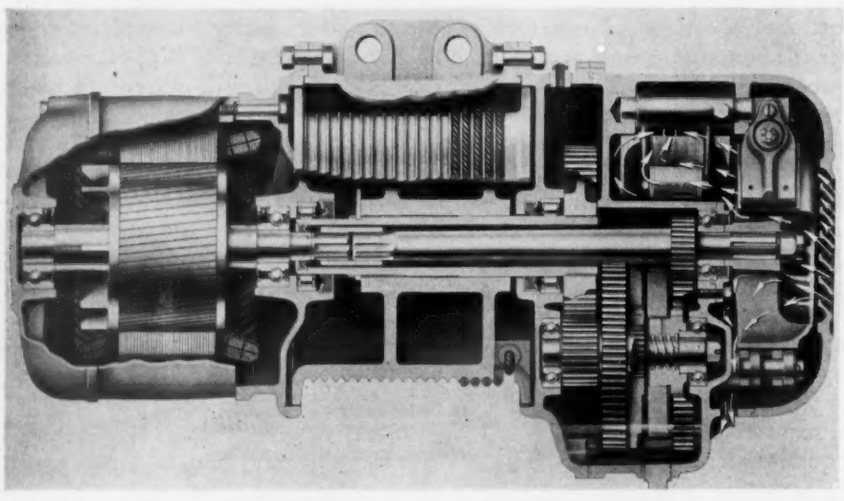
■ The problem of how to cool the load brake and main gear assembly in wire rope hoists has received ingenious treatment in a design recently introduced by Yale & Towne Mfg. Co., Philadelphia division, Philadelphia. Known as the Yale Cable King hoist, this unit incorporates provision for positive cooling of the load brake and main gear assembly. A fan sucks outside air into the motor-brake housing. Air is then forced to circulate over and around housing containing load brake and gears as shown in cut-away diagram by arrows.

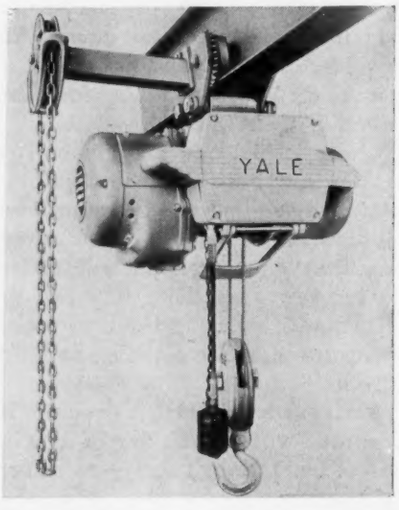
Gears and load brake are totally enclosed to prevent entry of dirt or dust. Both gear train and load-brake mechanism operate in an oil bath. Cupped leather seals of spring-pressure type eliminate leakage where shafts extend through housing. Load brake is Weston screw and disk type, self actuating, mounted between the first and second gear reduction. Brake surfaces have oil ports to insure a continuous wash of oil. This not only maintains a constant friction but absorbs the heat developed in the brake. Heat is subsequently removed from the oil by the blower action of the motor brake drum on external ribs of the gear and load-brake housing.

Cooling fan is built integral with the motor brake which is external, contracting, drum type, actuated by a plunger type solenoid. Brake is accessible for examination, maintenance and adjustment by the simple removal of the housing end head. While motor brake mainly controls motor "drift," it has sufficient capacity to hold the full hoist load.

Due to this design, the makers are able to guarantee satisfactory performance of the unit on extremely high foot-ton duty cycles and minimum of hook movement when "spotting" or "inching" loads. Hoist is made in a multitude of styles for ¼ to 6-ton loads. Accompanying model illustrates the geared trolley type with hoist suspended at right angles to the I-beam or overhead support.

Left, cut-away diagram shows internal construction and method of removing heat from gears and load brake by air blown against housing. Right, external appearance of hoist as made in geared trolley type





Engineers Can Lend Helping Hand In Field of Industrial Relations

(*Continued from Page* 20)

M. D., director, laboratory of applied physiology, Yale university, New Haven, Conn.

In summarizing his remarks, Dr. Haggard said: "I have tried to emphasize and elaborate one point. It is this: There is no isolated, no separate, no independent part of the body; the body operates as a whole. When the engineer creates or controls environments in which the body is to operate, any change in any one feature of the environment affects the body as a whole. Furthermore the effect on the body alters its reactions and tolerances to all pre-existing conditions in the environment . . . .

"Today, the engineer goes into every field touched by man and there he creates for men new and changed environments. Each creation, each change, involves a reaction—a physiological response. . . . My hope is that engineers will recognize this factor and give it its proper consideration."

Recommends De-centralization

Declaring that recent developments point to reversal of the long-accepted pyramidal structure of management, F. E. Raymond, associate professor, industrial research, Massachusetts Institute of Technology, Cambridge, Mass., pointed out that de-centralization, in contrast to centralized authority, may not only facilitate leadership but may also provide a means of broadening the organization structure to draw administrator and worker closer together.

Commenting on questions of economic size of the business enterprise, the speaker said that the test as to the ultimate trend in his opinion will be "whether human beings have the capacity to administer wisely a large enterprise, to devise means for holding together the thousands of people in their employ and to provide at all levels satisfying incentive and opportunity."

In an address on corporate organization, Marvin Bower, partner, McKinsey, Wellington & Co., New York, discussed a number of major organization principles, violation of which, in his opinion, results in high cost and loss of effectiveness. He summarized them as follows: (1) As activities to be supervised become more numerous or complex, responsibility for their supervision should be delegated to subordinates; (2) an executive should be given sufficient authority to discharge satisfactorily the responsibility delegated to him; (3) when grouping activities for delegation of supervision to subordinates, an executive should classify them to permit maximum efficiency in supervision by one individual; (4) the plan or organization should provide for supervision of all essential activities; (5) one superior should not have more subordinates than he can co-ordinate effectively; (6) adequate provision should be made for co-ordination of related activities to insure that common objectives will be attained; and (7) that distinction between line and functional authority should be recognized.

The "line" executive, he explained, determines the need, time and place for action, while the executive with "functional" authority defines a method. Unless each executive recognizes the nature of his authority and governs himself accordingly, conflicts will arise, he added.

Declaring that proper job evaluation is one of the most important problems of personnel and industrial relations, J. E. Walters, director of personnel, school of engineering, Purdue university, West Lafayette, Ind., presented an analysis of several job evaluation plans currently in use with particular reference to two types, namely, the grading or ranking method and the rating or point system.

To develop his study, Mr. Walters sent out letters to 80 companies. He received replies from 63, of which 32 had established job evaluation procedures. The remainder either had no definite procedures or informal plans of accepting the prevailing rate in the community as the value of jobs and of judging new jobs from the old ones. Of the 32 plans, he said, 27 were of a formal character and 5 of a somewhat informal description. The formal plans were largely divided between the grading and point system methods, he said.

Grading System Analyzed

The grading system, he observed, usually consists of the following steps: (1) Making of job descriptions; (2) grading or ranking of jobs according to value; (3) correlation of job values with present wages; and (4) adjustment of wages.

Steps in evaluating jobs by the point system usually are (1) the selection of job factors; (2) the weighing of the job factors in points; (3) preparation of job-description, job-analysis and point-rating forms; (4) description, rating, and evaluation of all the jobs; (5) correlation of the point values with rates and wages; and (6) the adjustment of wages which are too high and too low for the value of the job.

After reviewing job evaluation plans of the 32 companies and because of the fact that about twice as many of the companies have a point system as those who have the ranking system the speaker said it was his opinion that the point system was the better.

Point System Better

Advantages, he believed, were: (1) More definite, systematic and scientific; (2) eliminates personal opinion and prejudices more than the other; (3) the sum of the judgments of the factors or elements of a job as set up under this system is more correct than the judgment of the job as a whole; (4) easier to compare the existence of the same characteristics in widely dissimilar jobs as is possible under this method than it is to compare those jobs as a whole; (5) appears to decrease argument because agreements as to the value of the elements seem to be in closer accord than the agreements as to the rank of each job as a whole; and (6) tends to make the judgment factor in job evaluation less impersonal and more exact.

He added, however, that the grading system has accomplished excellent results in some companies and is favored by a few personnel directors of long experience.

The speaker believed that the following should be considered for improvement of job evalution: (1) More extensive use of job evaluation methods; (2) a greater standardization of methods; (3) the factors or elements of the job should be more objective in an attempt to obtain a numerical measurement; (4) the factors of the job be considered as accurately and minutely as the cost of evaluation will permit; and (5) greater co-operation with employes or their representatives in evaluating jobs.

Unions, such as SWOC, are recommending the point system to their locals. He thought, therefore, it would be advisable for the unions and management to co-operate so that the methods will be agreeable before an agreement is established by collective bargaining. It should prevent many wage difficulties, he believed.

Discussing hard surfacing and materials, Myron L. Begeman, associate professor of mechanical engineering, University of Texas, Austin, Tex., outlined 18 different proc-

esses and described properties of the surfaces obtained and their application in industry.

He referred to carburizing as the oldest known method of producing a hard surface on steel and pointed out that it has a wide application as it is particularly suitable for creating hard-wearing surfaces on machine parts. Pieces ranging in size from armor plate to ball bearings may be treated successfully by this process, he said. Hardness obtained is limited to that of a martensitic steel, maximum being around 750 brinell.

Nitriding, Mr. Begeman pointed out, is somewhat similar to ordinary case hardening, but uses a different material and treatment to create the hard surface constituents. As nitrogen has great effectiveness with certain elements, special nitriding alloy steels have been developed. Aluminum in percentages from 1 to 1.5 has proved to be especially suitable in steel, he said, as it combines with the gas to form a stable and hard constituent. Chromium and molybdenum are important elements in such steels; also vanadium, manganese and tungsten may also be used effectively.

Nitriding steels by virtue of their alloying content are stronger than ordinary steels and respond readily to heat treatment. He recommended that these steels be machined and heat treated before nitriding as there is no scale or further work after this process.

Metal Spraying Discussed

A comparatively recent development and one rapidly becoming more important, Prof. Begeman stated, is spraying of molten metal. Any metal in wire form can be applied in this manner. He emphasized the importance of the surface of the metal being properly prepared before spraying, because the bond between the sprayed metal and the parent metal is entirely mechanical. Usual method of cleaning and preparing this surface is by blasting with sharp silica sand or angular steel grit. Cylindrical objects, he added, may be prepared by rough turning a lathe.

Wearing quality of sprayed metal is good as evidenced by its wide use in building up worn shafts and other machine parts, although success of the process is due largely to its economy and the rapidity of which the metal can be applied. Its field of application is large, he pointed out, since practically any metal can be applied to any other commercial metal and to other base surfaces.

Electroplating has long served as a means for applying decorative and protective coatings on metals, he brought out; also that chromium is the outstanding metal for electroplating, where wear and abrasive resistance are required. According to the brinell scale, hardness of plated chromium ranges from 500 to 900. This wide variation, he pointed out, is not due to the metal, but to plating methods or inadequate equipment.

Where thick coatings of materials are required, it is necessary to use some form of welding, the speaker said. The electric-arc process is simple and economical. The acetylene process operates at a lower temperature than the electric arc and can be controlled more readily where excessive puddling of the material is not desirable, he declared. He pointed out that a certain amount of penetration of bonding is necessary when applying hard facing materials, but in general it should be kept to a minimum so as not to dilute the weld metal with the parent metal.

Classifies Facing Materials

Prof. Begeman classified the hard facing materials as "overlay" and "diamond substitute" types. The so-called overlay materials include such metals as high carbon steel, ferrous alloys that include such elements as chromium and manganese, and numerous nonferrous alloys containing principally cobalt, manganese and tungsten. Diamond substitutes, generally referred to as cemented carbides, include tungsten carbide, tantalum carbide, titanium carbide, boron carbide and chromium boride, or a combination of these and other carbides with a suitable cementing agent.

The Chapmanizing process, like nitriding, is based on the fact that ferrous metals will absorb nitrogen and carbon to form a high compound when heated to high temperatures. While the results of this process are somewhat similar to nitriding, they are accomplished in a different manner. He said the process is claimed to be more rapid than most case hardening processes and does not require special analysis steel for successful results. A hard case can be obtained, ranging from 700 to 1100 monotron brinell; this variation depending largely on the type of steel and its quenching.

The dry cyaniding process calls for continuous gas carburizing and nitriding. The operation is conducted in a continuous muffle furnace; the carburizing gas is introduced at the charged end and the ammonia gas at the point where the parts to be treated have come up to desired temperature. A thin film of amorphous carbon is formed on the object being carburized, he said, and this reacts with the ammonia at the high temperature to form a hydrocyanic-acid gas.

This gas, he said, has proved to be an effective cementation reagent and when produced in this manner has little hazard attending its use. A variety of S. A. E. steels have been used at temperatures ranging from 1150 to 1550 degrees Fahr. The final hardness is obtained by oil quenching and the hardness value, according to Rockwell C, ranges from 50 to 65. Case depth for a treatment of about 2 hours is approximately 0.010-inch.

The Ni-Carb method, he pointed out, is similar to the dry cyaniding process. Temperature employed may be varied from 1200 to 1600 degrees Fahr. The process is intended primarily for thin cases. Most steels may be treated by this process as well as steel castings, cast iron and malleable iron.

Induction hardening is a relatively new development, the speaker said. An important feature is its rapidity of action, since it requires only 5 seconds to heat steel to a depth of ⅛-inch. Another advantage, he pointed out, is that only a small percentage of the weight of the object to be treated is heated to the necessary high temperature. This procedure minimizes warping and consequently necessitates only a small allowance for finish grinding.

Plain hardening is also based on rapid heating and quenching of the wearing surface. This method is usually applied to fairly small work when heating time is short. Some of the advantages claimed, he said, are that hard surfaces with a ductile backing may be obtained, large pieces my be treated without heating the entire part, the case depth is easily controlled, the surface is free from scale and the equipment is portable.

Yield Point Studied

Unlike copper and aluminum, low carbon steel does not yield in tension until an excessively high elastic resistance has been built up, according to Joseph Winlock and Ralph E. W. Leiter, chief metallurgist and assistant metallurgist, respectively, Edward G. Budd Mfg. Co., Philadelphia. This was brought out in a presentation of results of a study in the yieldpoint phenomena in low carbon steel with a view to determining the mechanism of the transition of the metal from the elastic to the plastic state.

The high elastic resistance, it was stated, is the upper yield point, believed to be of fundamental importance in the Luders' line phenomena.

Effect of speed of stretching and rate of loading on yielding of mild steel was discussed by E. A. Davis, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Asserting that the phenomena occurring at the upper and lower yield point in mild steel is not yet

(*Please turn to Page* 81)

Steel carries the tang of the sea
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Millions of fish travel every year from sea to dining table, in cans made of Tin Plate (steel coated with tin). In fact, your entire menu depends on steel -- without it, your meals would be sadly unappetizing.

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Requirements such as these consumed a large percentage of the 2,500,000 tons of Tin Plate produced in 1937.

Millions of dollars have been spent by Youngstown to be sure that the tin plate from which these cans are made is correctly suited to the use to which it is put. In fact a great laboratory and special staffs of research and field experts are constantly at work to make every product bearing the Youngstown name the finest that modern science can produce.

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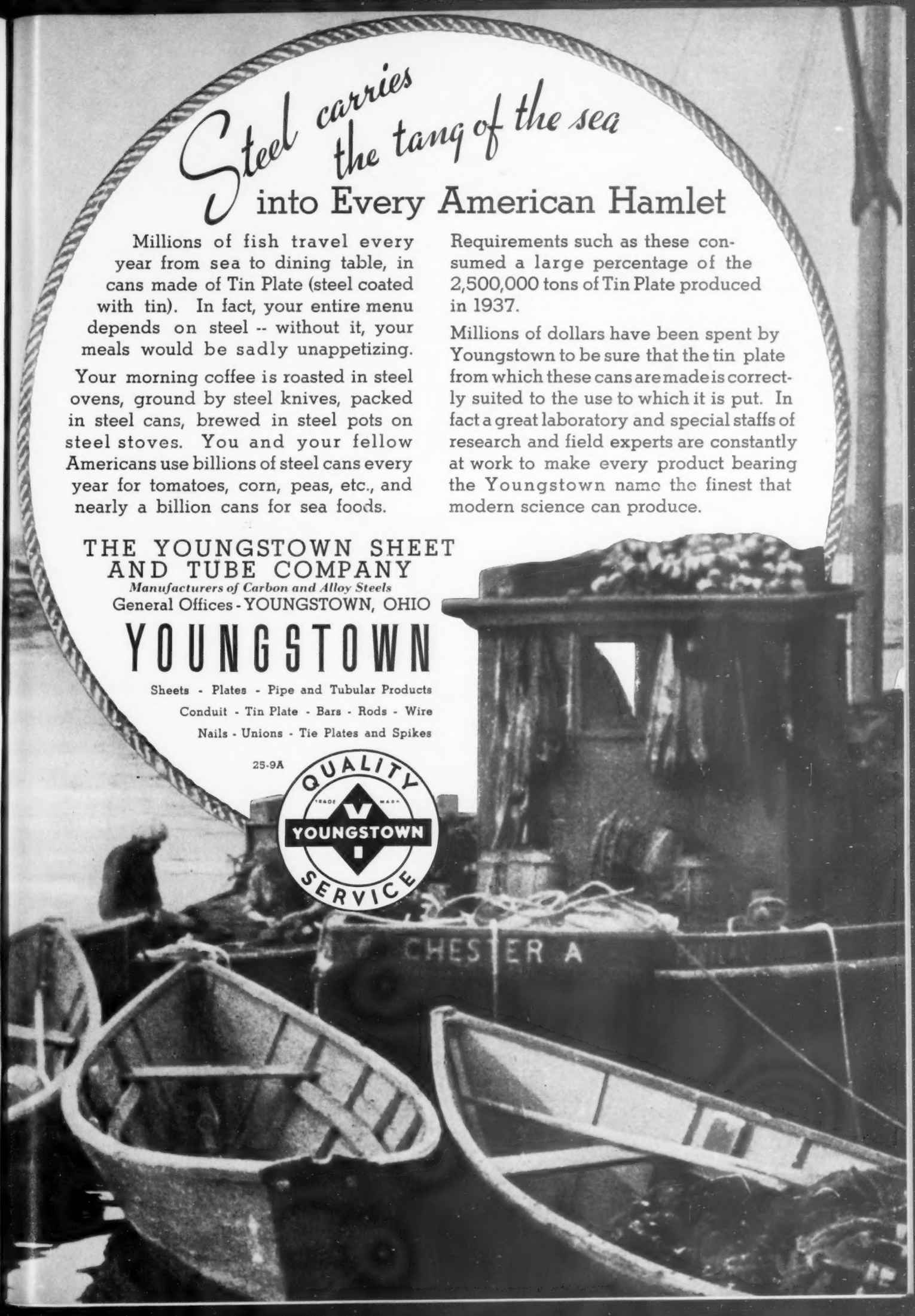
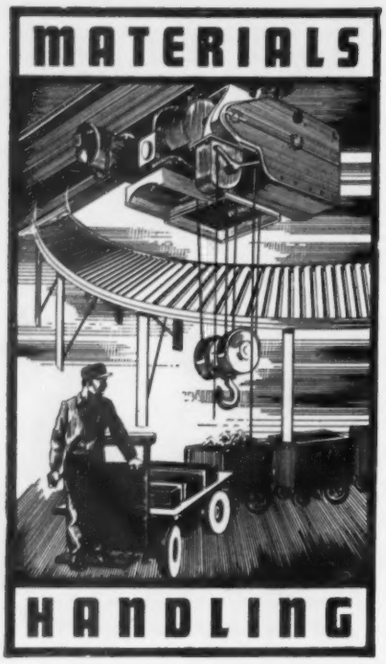
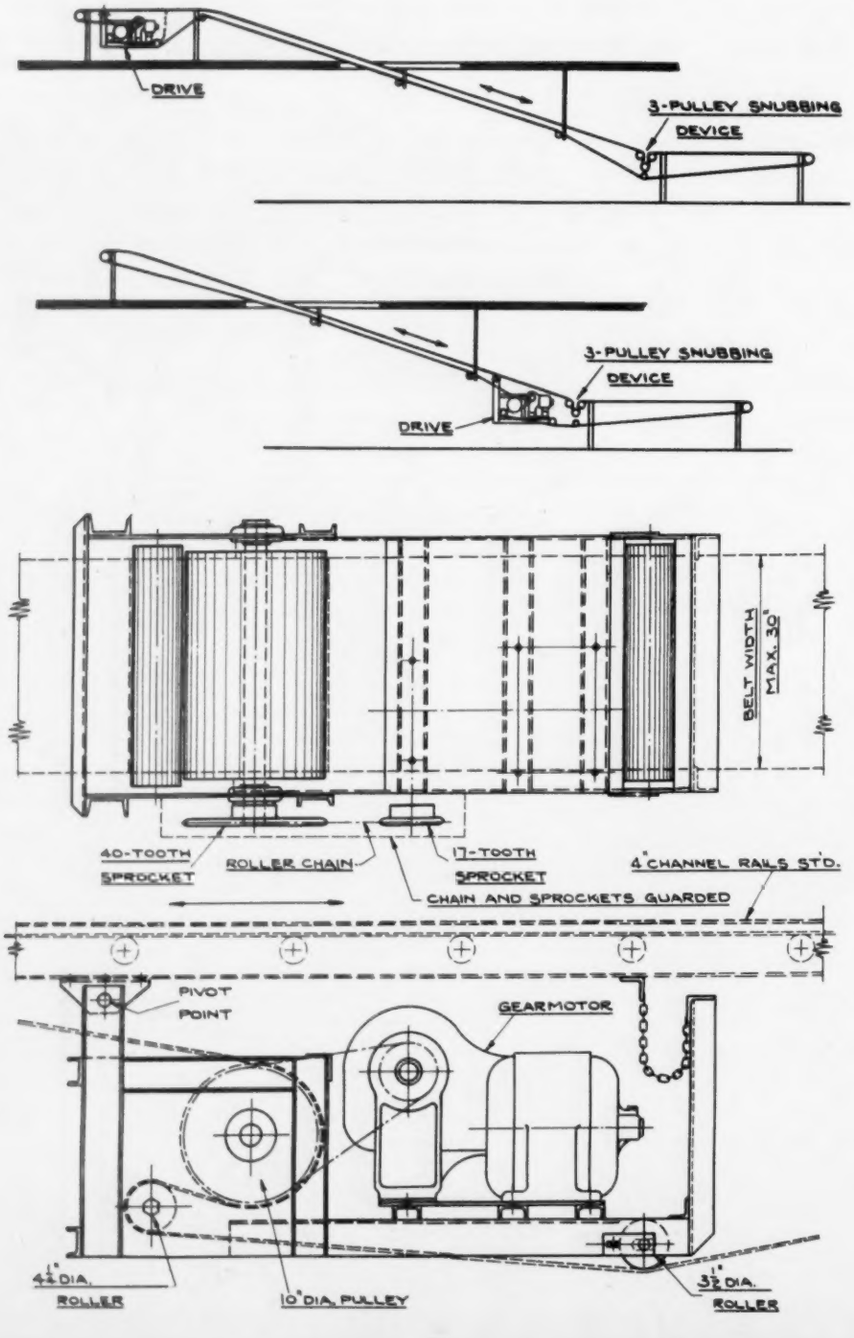




New Conveyor Drive

Unconventional drive for conveyors features an automatic, constant belt-tension action. Can be adapted to wide variety of conveyor arrangements and power source locations



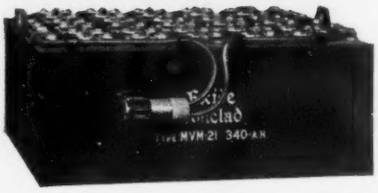
■ DIFFERING considerably from conventional drives, a unique yet practical means of driving belt conveyors has been developed by H. W. Wylie, engineer, Mathews Conveyer Co., Seattle, Wash. The drive offers a number of advantages. For example, the driving mechanism can be located at any point along the length of the belt conveyor instead of at the head end which is usually considered essential.

This feature, illustrated in Fig. 1, is important since it affords considerable flexibility and permits compactness in laying out a conveying system. A typical advantage is that it permits locating the drive adjacent to existing power sources. Also, where it is desirable to locate the conveyor drive in or outside of a certain room or area, this can be done easily. The design not only permits locating the drive beneath the conveyor but even within the confines of the conveyor frame. Yet it is readily accessible for maintenance purposes.

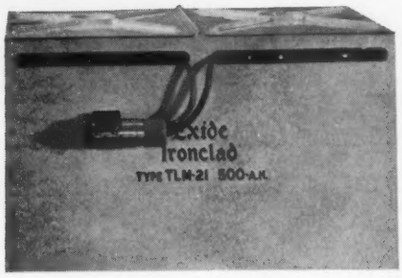
Fig. 2 shows the right end of the drive frame detached from the conveyor frame (actually connected by means of a loose length of chain). This is perhaps the most important feature since it affords a positive means of securing "maxi-

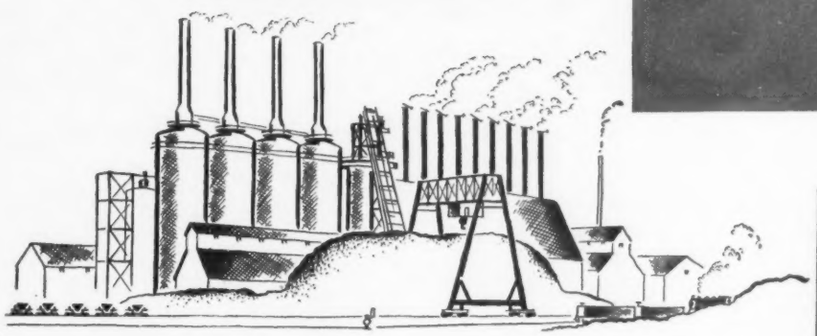
(Please turn to Page 77)

Upper two diagrams, Fig. 1, show how power source can be located at various points on conveyor line. Lower two diagrams form Fig. 2 and are plan and side views of drive unit or power source. Constant belt tension is maintained by weight of power unit



THE EXIDE-IRONCLAD BATTERY MOVES AHEAD WITH STEEL . . .





All sizes of Exide-Ironclads now available in steel trays.

THIS month marks the end of another year, the fiftieth for the Electric Storage Battery Company. It also marks the end of another memorable year for Exide-Ironclad Batteries in the steel industry.

During the last year, more steel plants than ever before put Exide-Ironclad Batteries to work propelling their industrial trucks. There are sound reasons for this decided trend in storage batteries for use in the industrial trucks of the steel industry, and particularly for the trend to Exide-Ironclad. Tests, demonstrations, and performance under actual service conditions have proved the absolute dependability of storage batteries and of Exide-Ironclads especially.

Now, with the new MEH Exide-Ironclad available in addition to the MVM, the TLM and the FLM types, there is a powerful, dependable and economical Exide-Ironclad Battery for *every* electric industrial truck—*including the largest.*

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To mark the fiftieth anniversary of Exide Batteries, a handsome souvenir booklet has been prepared, illustrating the essential part these batteries play in daily life. Write, and we will gladly send you a free copy.

High Production

Output of press shop is increased several times by employing a method to increase speed of presses. Less breakage of dies and lower power consumption are also reported

■ RECENTLY a manufacturer making automobile, truck and bus parts sought some method to increase output of stamping equipment. This plant uses more than a million pounds of sheet steel daily in its production and required means of speeding up punch press operations to keep up with this schedule.

A study disclosed that increasing the speed of punch presses themselves would be perhaps the best method of increasing production, as material handling methods and other fabricating steps were sufficiently fast to take care of the production desired. On the particular operations involved, it was found that the clutches limited punch press speed and that going to a friction clutch immediately made it possible to obtain a much higher output from the presses.

A friction clutch was found to have several advantages on this application. Quickness in pick-up speed with less shock to the machine resulted of course in longer life to the equipment, less vibration in the plant and less noise to cause operator fatigue. Also, there is less strain on the crank and press parts, as the starting shock is eliminated and changed to a smooth pull. This also results in smoother die action.

In shifting over to the friction clutch, it was found absolutely essential to give the operator of the punch press the same foot-pedal feel that existed with operation of the usual clutch. To obtain the maximum output, the operator already familiar with a certain type of pedal action must necessarily employ the same action.

In applying friction clutches to single crank, direct driven, punch presses, the clutch must be quite large and extremely rugged because of relatively low speeds of crank and flywheel which, of course, results in high instantaneous torque loads as the clutch is engaged.

These requirements were successfully met in the press shown in the accompanying illustration. To obtain the required torque capacity within the space available inside the flywheel, the clutch cone is faced with friction material. Also it has a pair of helical gears on splined members one of which is keyed to the shaft and the other attached to the friction cone housing.

This type of clutch had been found satisfactory in a previous application on a machine used in stripping coal where the clutch had to withstand the impact of the boom traveling at full speed into a solid shale wall.

To actuate the clutch, a conventional foot pedal is used. This mechanism causes a light contact between

This press with a friction clutch inside gear at top blanks and forms 37 lineal inches and three 2-inch holes to average 2000 pieces per hour

the friction and mating cone attached to the press flywheel. Inertia and contact between the tools and the work acts through the splined members to wind up the helical gear, causing a pressure on the friction cone and its rotating member that eliminates any chance of slipping.

A conventional cam track and roller latch mounted on the circular cam plate attached to the end flange of the outer splined member is pushed endways by the roller into a circular safety groove which prevents accidental double tripping. This means that the only time the press will operate is when the foot lever is pressed. The action of the foot pedal, as far as pressure and leverage movement are concerned, is quite similar to conventional clutch action, so the operator easily obtains full advantage of the high speed available.

Torque Capacity Variable

Through an adjustment of the amount of turn or wind that the helical gears exert, it is possible to vary the torque capacity of the clutch and the resulting ram pressure. This is a definite advantage because certain dies are used that only require 20 tons and other dies that require over 100 tons. This definite limitation of maximum pressure has been found valuable as the clutch will slip if the die has been accidentally overloaded by getting two pieces instead of one, thus greatly reducing the hazard of broken dies or press frame.

Another important advantage is that this press requires less power to do the same amount of stamping and forming since the flywheel is connected tight to the ram and crank. This permits practically all of the energy, which is stored up in the two 40-ton capacity springs and the twelve 500-pound springs during compression on the down stroke, to be returned to the flywheel before it is released at top of the return stroke.

Results in this plant have been quite satisfactory. The material handled is 20-gage steel and production averages 2000 pieces per hour. In one particular job, 37 linear inches are cut, three 2-inch holes are perforated and the edges formed down $\frac{5}{8}$-inch all around the 37-inch edge. The three holes also are formed down $\frac{5}{8}$-inch, totaling a considerable amount of work on this combination blanking, perforating and forming die.

Platen size of this particular press is 28 x 38 inches and the stroke is 5 inches. One of these presses is operated at 90 revolutions per minute but the particular press handling the operations described runs at an average speed of 65 revolutions per minute with a 15-horsepower motor.

In developing this press, heavy plates were welded to make up the frame and to give maximum design flexibility. The units described were designed and built by R. D. Eaglesfield, Indianapolis, Ind.

♦

Heat Treating Text Revised and Enlarged

■ *Steel and Its Heat Treatment*, Vol. I, by D. K. Bullens; cloth, 445 pages, 5¾ x 9 inches; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $4.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W.1.

Rewritten and reset, this fourth edition of the work originally published in 1915 brings the subject up to the present. The metallurgical staff of Battelle Memorial institute assisted in its revision. Except for an added chapter on nitriding in the 1935 printing, the work had not been materially revised since 1927. Much new information becoming available and many of the old principles receiving fresh verification in the past decade it became imperative to do a thorough revision to maintain a position of leadership.

Among features in which major advances have been made since the former edition are: An understanding of the significance of the grain coarsening tendencies of steels and developments in their control; use of controlled atmospheres; the rise of high yield strength, low-alloy steels, insulating refractories for furnaces, forced circulating for more uniform heating in tempering, gas carburizing and other processes; use of gas-fired radiant tubes for large furnaces at moderate temperatures; use of copper as an alloying element in steel; normalizing instead of annealing in steel castings, and a clearer conception of the mechanism of heat treatment and the specific effect of all the alloying elements.

These necessitated introduction of new chapters and condensation or elimination of other matter. It became necessary to expand to two volumes, the first of which has been printed. It is devoted to heat treatment of steel in general, whether plain carbon or alloy. Volume II will cover engineering carbon, simple alloy, complex alloy and special-purpose steels.

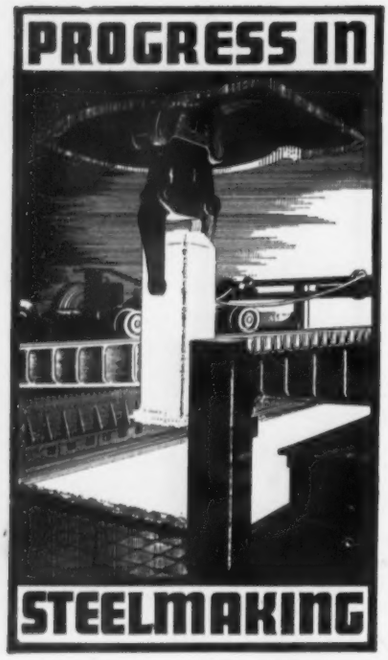
Spiral Standard Holds

■ Simplified practice recommendation R-53-32, steel reinforcing spirals, has been reaffirmed without change by simplified practice division of the national bureau of standards, after review by Concrete Reinforcing institute, its sponsor. It became effective in 1927, was reaffirmed in 1930 and revised in 1932. It establishes a recommended list of four sizes, a variety reduction of about 43 per cent.

Copies at 5 cents each may be obtained from superintendent of documents, government printing office, Washington.

Textile Industry's First Continuous Mill

■ **What the first continuous rolling mill did for the steel industry, this new Painesville, O., plant of Industrial Rayon Corp. may do for the textile industry. Here, for the first time, new rayon type yards proceed continuously from the spinning head forming the threads, through dyeing and treating processes ending in a yarn ready for weaving. Building took 6500 tons of steel; equipment includes 50 miles of piping besides 550 tons of 48-inch pipe for lake water intake; 1000 tons for welded steel tanks; 2750 tons for spinning machines**



Furnace Instruments

Modern instruments for the blast furnace save fuel, increase production, improve product. Eleven such instruments are described here and their connection with furnace operations detailed

By F. N. HAYS
and
J. P. MIKALOFF
Carnegie-Illinois Steel Corp.
Duquesne, Pa.

■ FEW FURNACEMEN recall the time when pressure and temperature measurements were not taken. They can, however, readily trace the great progress in development and application of other instruments in their field. This progress is due largely to a realization of the vast field in open hearths, soaking pits, heating furnaces and rolling mills for savings in fuel, increases in production and improvement of product.

Instruments considered by many as absolutely essential to regular and economic operation of a present-day plant include those for blast temperature, automatic hot blast temperature control, automatic combustion control for stove burners, stove stack temperature, stove dome temperature, stock line recorder, top temperature, blast pressure, top pressure, blast volume, humidity and atmospheric pressure.

Temperature Variation Lowered

Recording hot blast temperatures made it possible to co-ordinate the relationship between temperature of blast, working of furnace and quality of iron. This, with the hand operated mixer valve, reduced temperature variation during a "stove on blast" period from several hundred to 20 or 30 degrees Fahr. Now automatic controllers give real "straight line heat."

An exposed chromel-alumel thermocouple in the hot blast main not far from the bustle pipe operates contactors and a relay controlling a motor-operated mixer valve, which permits a part of the cold blast to by-pass the stove and bleed into the hot blast main, thus lowering the temperature to the point desired. Operations with a high hot-blast temperature effect a reduction in the coke rate of the furnace. The silicon and sulphur content of the iron are also affected by variations made in the hot blast temperature. This equipment is especially beneficial, because regularity of stock movement can be benefited materially through quick and accurate control of hot blast temperature.

First step in improving combustion conditions was the application of an automatic control constant gas pressure at the stove burner. This made possible setting the air shutters for proper combustion. Once set, combustion was maintained for a considerable period of time before resetting of the shutters was found necessary. Next step was introduction of pressure burners which, combined with larger stoves, cleaner gas, smaller checker openings and tangential firing, have resulted in higher blast temperatures, more uniform iron, reduced coke rates and higher stove efficiencies. Improvement in the latter has been so marked that it is common for stoves to operate on 20 per cent or less of the total gas produced by a furnace.

Stack temperatures are used to determine degree of saturation of heat in the checker brick. Experience has taught that certain stack temperatures must be reached before a stove is capable of supplying the heat for various hot blast temperatures. Fuel losses obviously occur when stack temperatures are carried above requirements. It would be possible to utilize a gas cut-off control similar to those used with open hearth roof or pit furnace temperature control to eliminate losses caused in carrying excessive stack temperatures.

A dome temperature recorder serves a new purpose by showing stove combustion chamber temperature, a guide to prevent excessive refractory temperature and to show the rapidity with which the stove heats when on gas and loses heat when on air. In conjunction with stack temperature, it gives a good picture of the heat in the stove.

Show Height of Stock

Much significance is paid to the stock line recorder when a furnace is operating irregularly. Modern stock line recorders, being tied automatically or interlocked electrically with the big bell, show not only the height of the stock and its movement but frequency or time interval between bell operations. In addition to the recorder, indicators are provided with a calibrated column of lamps to show the burden level in cast house for the blower operator, and in stock house for benefit of the skip operator. Both indicators work simultaneously.

Attention has sometimes been called to the variable in stock distribution, introduced by differences in the speed of opening the big bell. This may vary from 5 to 25 seconds with an air or steam-operated cylinder and is not shown on the stock line recorder. Possibly it

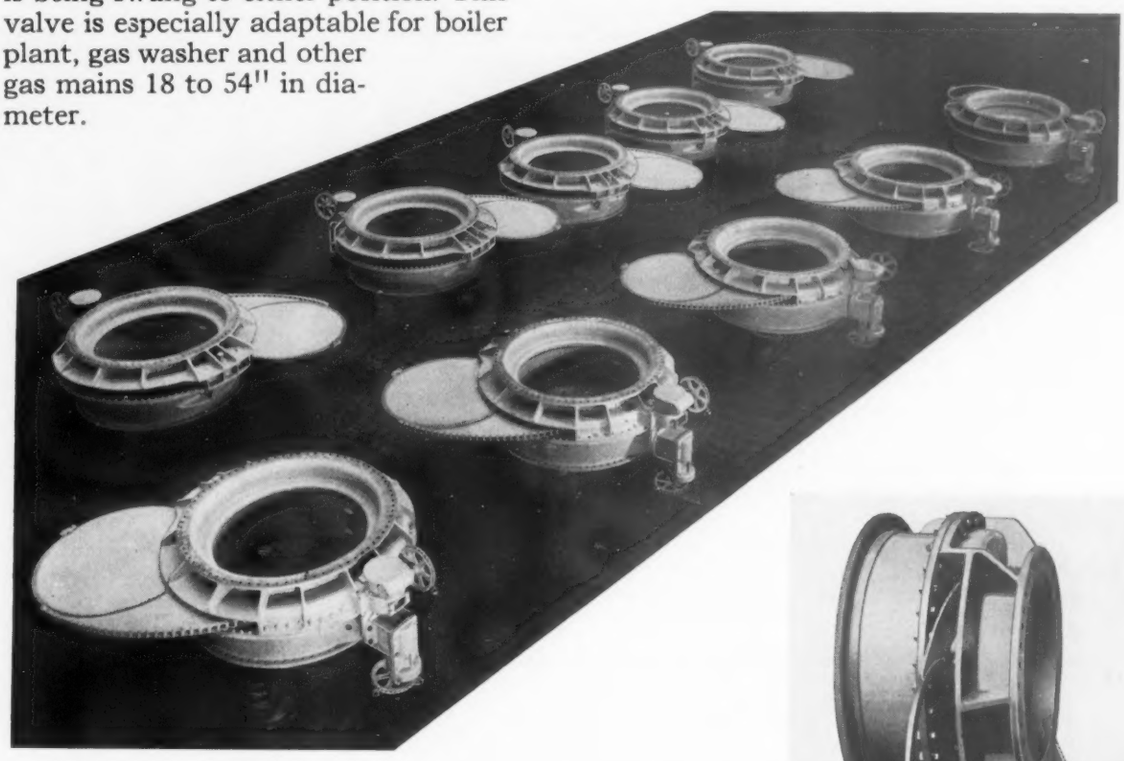
Abstract from paper presented at instrumentation conference, Carnegie Institute of Technology, Pittsburgh, October, 1938.

The American . . . . .

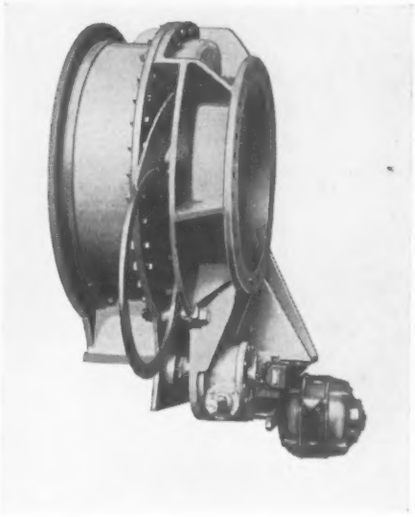
MECHANICAL GOGGLE VALVE

PATENTS GRANTED and PENDING

This Valve is designed with a diaphragm plate or expansion joint inside the valve so that the movement of the gas main is not necessary to free the goggle plate for swinging. With this design, the plate may be covered so that gas cannot escape to the atmosphere when plate is being swung to either position. This valve is especially adaptable for boiler plant, gas washer and other gas mains 18 to 54" in diameter.



Ten 72" Valves Built for Export.



Built for hand operation of valve and goggle plate or with single motor operating both valve and plate.

80 Valves Installed in Two Years

Simplex Design
Single Motor

Operates the Valve and swings the plate to either position. Time — Complete cycle — 20 seconds.

WILLIAM M. BAILEY COMPANY

PITTSBURGH *ENGINEERS* PENNA., U. S. A.

could be incorporated, or be shown on a separate recorder, with considerable advantage.

Top temperature records show temperature of gases leaving the furnace and are carefully watched for indications of furnace irregularities. Many plants water the stock before it enters the furnace, thus reducing the top temperature. When top temperatures are not maintained at a fixed minimum by watering the stock, proper charging and proper distribution of gas through the stock, the dust content of the gas rises abnormally. While this dust may be recovered in the apparatus commonly installed for that purpose, sintered and then returned to the furnace, this all adds to the cost of producing iron.

Pressure Gage Important

Probably the first instrument used for the guidance of the furnace operator was a blast pressure gage. Blast and top pressures are both important indices of furnace and auxiliary performance. A blast pressure recorder indicates regularity of movement, checks, casts, tuyere changes, etc., and serves as a general guide of "when" and "what" the furnace has been doing. Variations in top pressure are indications of the rate at which auxiliary equipment is consuming gas when the furnace is operating regularly. When working irregularly, frequency and severity of slips may be determined from the top pressures.

Another measurement quite essential to the proper operation of the blast furnace is the volume of air used for blast, usually determined from revolutions of the engines as shown by a stop-watch, revolution counter, magnetic tachometer or any combination of these.

When turbo-blowers are employed, general practice is to install an orifice plate or venturi tube at blower inlet. The differential established may be recorded and integrated on a flow meter and made to represent volume of wind blown. This differential may also be employed to actuate control apparatus to maintain any desired volume of blast.

All blast furnace plants are equipped with a wet and dry bulb thermometer for determining the humidity of the air, and also a barometer for the determination of atmospheric pressure. To maintain a constant weight of air delivered to the furnace it is customary to alter blower speed and thereby compensate for changes in atmospheric temperature and pressure. Temperature of the hot blast is also changed with humidity variations. Humidity determinations are important since moisture carried into a 1000-ton furnace with the blast may vary from 72 gallons per hour in the winter to 1100 gallons per hour in the summer.

Failure of early investigations in use of dry blast was due to lack of proper hydrating facilities and to cost. With development of modern air conditioning equipment have come improved hydrometers and controls. Both original and operating costs are considerably under previous figures. It may not be too optimistic to predict that furnaces will yet be operated on seasonal schedules of fixed cold blast temperature and humidity. This prediction is justified because during dry blast investigations not only was the calculated carbon saving of about 9 per cent actually exceeded, but there was also a sizable increase in furnace production and improvement in furnace regularity.

Studies and investigations have shown the importance of iron and slag temperatures on the regularity of the quality of iron. Variations in the temperature of different casts show a relation of temperature to the sulphur and silicon analysis.

The C-SiC thermocouple developed by Dr. Fitterer has many advantages claimed for it. The United States Steel Corp. Research Laboratory has developed and had in service for several months at Gary, Ind., an instrument employing the photronic cell for taking steel temperatures in the bath of an open hearth furnace. Favorable reports have been received on the results and practicability of this method.

Stacks Coils from Either Side

■ **Where coils must be stored in areas served by narrow aisles with loading and unloading to be handled from either side, a long flat-plate platform like the 60-inch one shown here on a Towmotor handles the job easily. Capacity of this unit is 3000 pounds with a lift of 75 inches. Platform is 60 x 30 inches.**
Photo courtesy Towmotor Co., Cleveland

British Steelmaking Symposium Published

■ *Symposium on Steelmaking*, by the Iron and Steel institute (British); 609 pages, 32 plates; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W. 1.

This is volume 22 in the special report series of the institute. It includes 23 papers and discussions on eight selected aspects of steelmaking practice by the acid and basic open-hearth process. It constitutes the proceedings of the symposium on steelmaking organized by the institute in connection with its annual general meeting in May.

Set Screw Assortment Contains Popular Sizes

■ With the idea of furnishing small hardware stores, automobile and tractor repair shops, refrigeration service organizations and industrial plants with a conveniently packaged assortment of the more popular sizes of safety set screws and wrenches, Holo-Krome Screw Corp., Hartford, Conn., has introduced its assortment No. 497, which includes 144 safety set screws and 48 wrenches. These screws fit such articles as: Oil burners, sewing machines, bicycles, lawnmowers, farm machinery, repair shop tools, etc.

HOW CARBORUNDUM HELPS BUILD A SHIP

FEW people realize it, but the abrasive products of The Carborundum Company have a lot to do with the building of the ships that go down to the sea. From propellor shafts and engine parts to the ship's steel plates; from the links of anchor chains to the accurately ground parts of the turbines; from the intricate parts of the mechanism of the ordnance and the other equipment of the ships of the Navy to the fittings of the luxurious cabins of the liners—from bow to stern there is scarcely a part of today's great ships or their equipment, that hasn't been ground, polished or sanded with abrasive products as manufactured by The Carborundum Company.

A fine ship is indeed a cross-section of modern industry set afloat. Almost every known industry has a part in its building and operation. And like all industry these great ships bear witness to the efficiency of grinding—the universal production and precision method. The Carborundum Company is proud of its contributions to the ship-building industry that gives us our Merchant Marine and the great battleships of the Navy.

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Hardness Factors

Study reveals most uniform results in hardening strip steel parts are obtained when size of quenched section is in line with carbon and manganese content

By PROF. WM. CONLEY
and
DONALD E. RODA

■ THREE YEARS of heat treating small high strength parts blanked from strip steel has uncovered many reasons for variable results. These variations are found in the production of a standard machine and could easily be stated without conducting a special experiment. However, to systematically evaluate the different reasons for change in hardness and strength, a tensile test piece was selected and heat treated like production parts.

Carbon and manganese, the two most active hardening elements, appear to be the chief reason for variations in strength after heat treatment. Quantitative determination of the part carbon and manganese play in hardenability was sought. This determination, although complicated, is useful. Other variables such as thickness of section, tempering, etc. affect hardenability and also show up while studying effects of carbon and manganese variations.

A variation of 0.20 per cent carbon causes a maximum variation in hardness between steels Nos. 1 and 2 of 12 points Rockwell C. in a section 0.080-inch thick by ½-inch wide, as shown in Fig. 1, and 0.12 per cent of manganese variation produced a maximum change in hardness between steels Nos. 2 and 3 of 30 Rockwell C. points in a section 0.120-inch thick by ½-inch wide. When the width of the quenched part was increased from ½ to 1 inch, as shown in Fig. 2, the ability of the manganese in steel No. 3 to maintain the hardness in spite of the greater mass is readily shown.

Before variations in hardenability due to carbon and to manganese in experimental parts can be compared to machine parts, test pieces must be drawn. Steels Nos. 1 and 3 when hardened and not drawn indicate this in Fig. 4. Here, although they fall far short of the maximum hardness obtainable in steel, internal hardening strains caused erratic low strength values. Fig. 3 shows the change in hardness resulting from drawing the test pieces at 625 degrees Fahr. for ½-hour. Since the hard parts responded more to the draw than soft parts, the variations in hardness found in the hardened state were greatly reduced.

For example, steels Nos. 1 and 2 in the 0.080 x ½-inch section now show only half the variation in hardness that they did before drawing at 625 degrees Fahr. or 6 points Rockwell C. for 0.20 per cent difference in carbon. Tensile test pieces were pulled and relation of strength to hardness, Fig. 4, determined. Outside of the three exceptions indicated in circles, strength bears a very close relation to hardness and every point change in Rockwell hardness results in about 4500 pounds per square inch difference in maximum strength.

It is not the purpose of this paper to compare the relative merits of light, high-strength machine parts and heavy, low-strength parts.

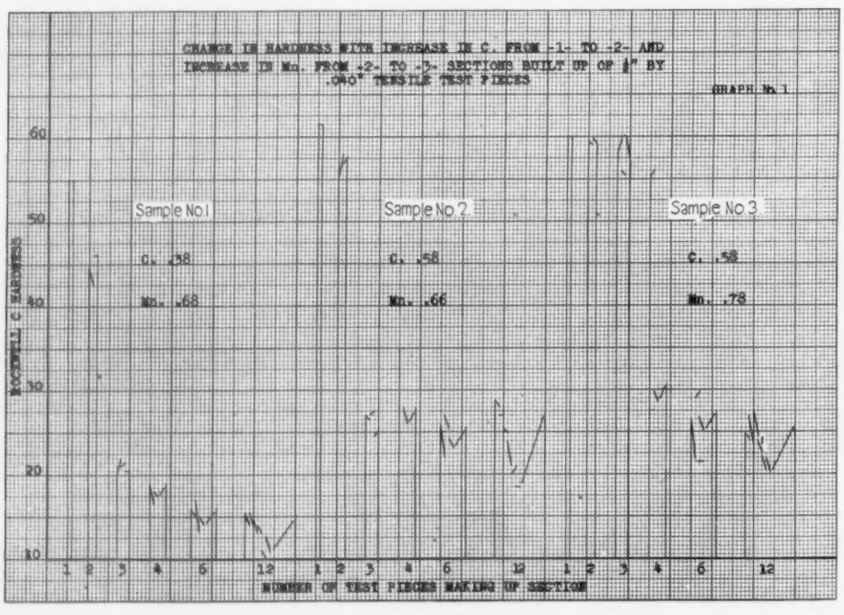

CHANGE IN HARDNESS WITH INCREASE IN C. FROM -1- TO -2- AND
INCREASE IN Mn. FROM -2- TO -3- SECTIONS BUILT UP OF ½" BY
.040" TENSILE TEST PIECES
GRAPH No. 1
Sample No 1
C. .38
Mn. .68
Sample No 2
C. .58
Mn. .66
Sample No 3
C. .58
Mn. .78
ROCKWELL C HARDNESS
60
50
40
30
20
10
1 2 3 4 6 12 1 2 3 4 6 12 1 2 3 4 6 12
NUMBER OF TEST PIECES MAKING UP SECTION

Fig. 1—Showing change in hardness from increase in carbon and manganese

However, it is almost certain that when a tempered steel part is used in place of soft iron, copper, a casting or other material, the size of the machine usually limits the design so steel members may be stressed nearly to their allowable strength. Using an accurate working load, parts designed of cold-rolled strip steel will be free from failure due to uniformity of the material, while high-strength heat-treated parts that, of a necessity, should be designed more accurately are subject to all the variations found on the four graphs.

The most obvious feature of all four graphs is not that manganese or carbon change the hardness or strength of the test piece, but that uniform results are obtained when the quenched section is in agreement with the carbon and manganese content. Therefore, with a table of steels increasing in thickness by increments of 0.040-inch that would safely respond to heat treatment, the designer could easily select the proper steel from the part's size and production heat treating methods.

Today the designer must choose from SAE steel specifications arranged according to composition. These permit a carbon range of 0.10 to 0.15 per cent and manganese range of 0.30 per cent. Thus, it is very difficult to select the proper steel from this table for a small, high-strength part. Even when a part is successful for one or two years, the wide spread allowed in carbon and manganese might cause failure later on depending on the section and composition.

Also, the carbon and manganese content often is furnished and accepted outside the SAE limits. An example of this is shown by steels

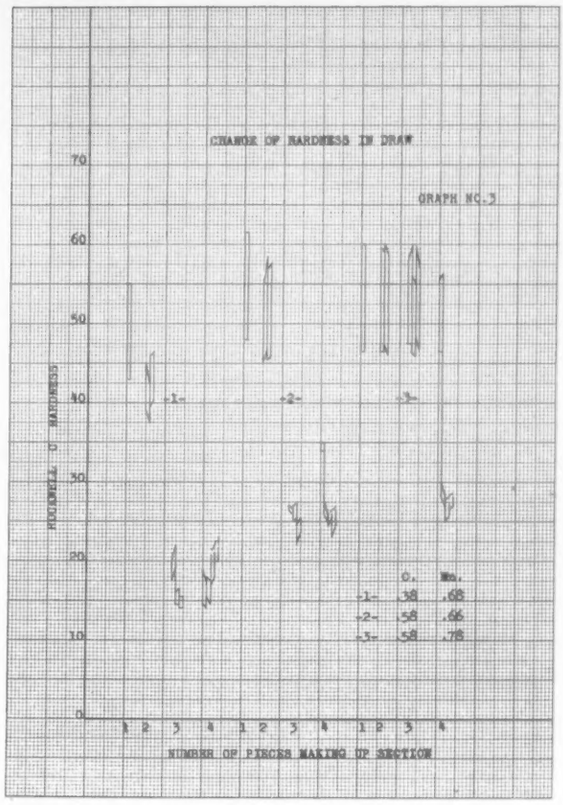


Fig. 3—This set of values shows how hardness changes in the draw for the three types of steels used in these tests. It also shows effect of number of pieces per section.

Nos. 1 and 2 in this paper which are both outside the SAE 1045 limits under which they are listed. Steel No. 3 also is outside the SAE 1050 limits under which it is listed. The following table gives the actual analysis of the stock described in this paper:

Carbon and Manganese Content of Steels Used, in Per Cent

Steel	Carbon	Mang.
1	0.38	0.68
2	0.58-0.60	0.66
3	0.58	0.78

Fig. 1 shows that the steels either harden or fall off very sharply. In between the hard and soft parts is a section or two that is on the verge of hardening. Quenched in oil at room temperature, these sections vary greatly in hardness due to slight variation of the quenching rate in the method used.

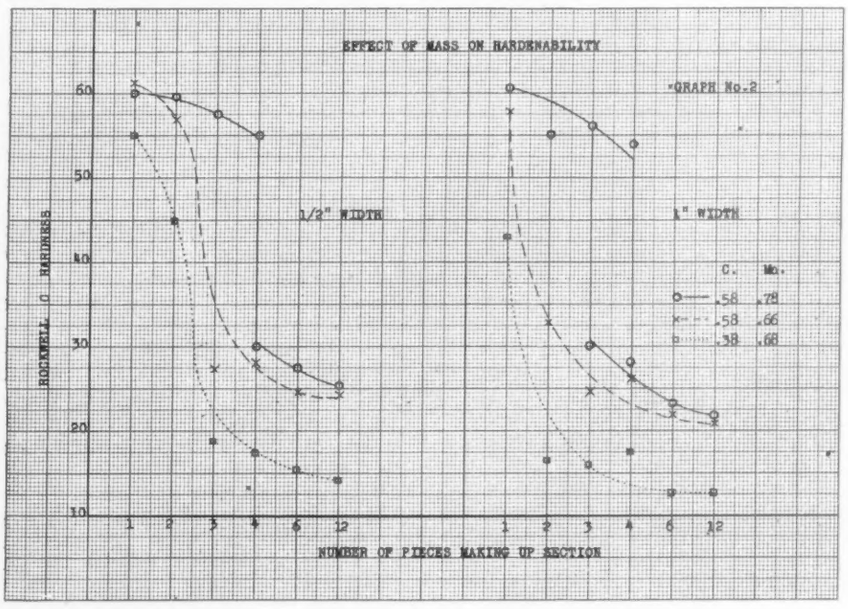
Fig. 4 compares oil quenching and tempering with direct transformation of austenite at constant temperature in a hot salt quench without further drawing. It is evident here that the hot salt quench gives more uniform results than oil quenching and drawing. On Fig. 4, all the strength values of the tempered test pieces are above the hardness values except one. This value is encircled and belongs to the center piece of the section made up of three pieces using steel No. 3.

Looking only at the hardness values on this graph, the section 0.120-inch thick in steel No. 2 is very critical to the quench while the same section in steel No. 3 appears to have responded very well to the oil quench.

The next section 0.180-inch thick again appears to be critical to the quench. Here the strength readings showed quenching strains and a section critical to the quenching rate that the hardness values failed to reveal. This was shown by the brittle failure of the center piece in the 0.120-inch section of steel No. 3 after being drawn. Duplicate tests produced the same results, although it was found in no other section in any of the steels. This is all the more reason why sections critical to the quench with any steel should be avoided. Since the machine parts might have a brittle failure under light load.

Further comparison between the oil quench and salt quench shows

Fig. 2—This demonstrates the effect of mass on hardenability



that these quenching strains did not appear in the hot quench. Many other features that indicate more uniform results by quenching into a hot tempering salt may be found by studying the strength values of this group of test pieces on Fig. 4.

Many Steels Analyzed

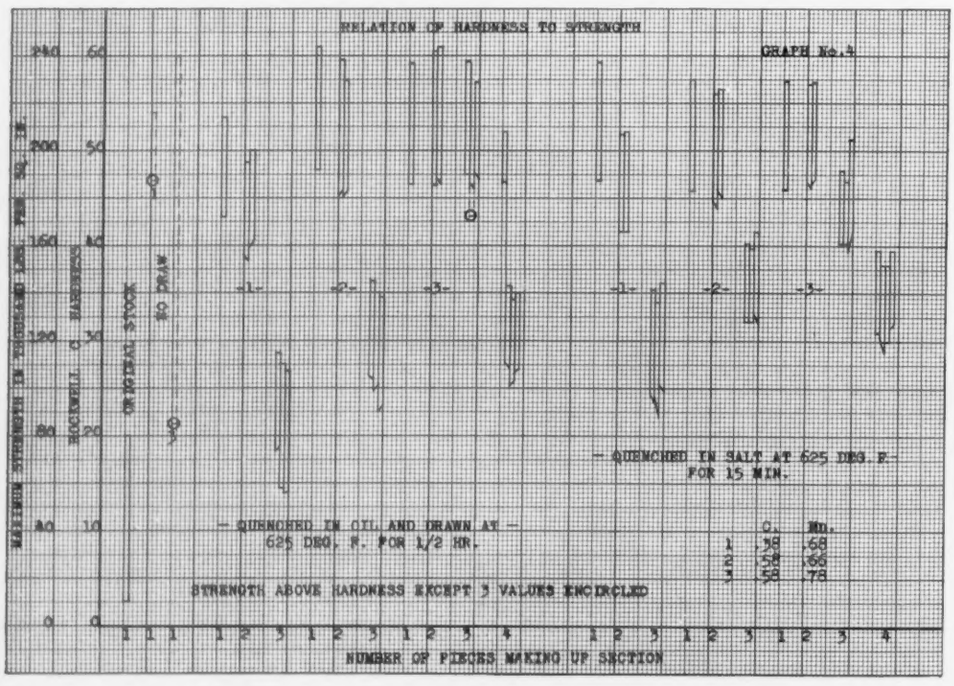
To find a pair of steels with a carbon variation and another with a manganese variation, 14 steels in the production steel rack of the same thickness and approximately the same SAE specification were analyzed. Fortunately, three steels were found that gave both variations reducing the number of test steels to a minimum. The microscope showed that the austenitic grain size was the same for these three steels.

A blanking die was made to cut uniform test pieces especially for the tensile tests. These pieces were then heated in a box type hardening furnace equipped with atmospheric control, held at the hardening temperature of 1480 degrees Fahr. for 5 minutes and quenched in a commercial quenching oil or drawing salt as indicated. Depth of quench was 2½ feet in oil and 2 feet in salt.

After hardness readings were made, steels that were quenched in oil at room temperature were drawn at 625 degrees Fahr. for ½ hour. Temperature of quenching salt was also 625 degrees and parts remained in the salt 15 minutes. Rockwell hardness readings were again taken along the center of the ½-inch tensile section and 1-inch grip section on all surfaces of test sections that were held together with light wire while being heat treated.

Tensile tests then were made on these pieces and in no case did failure occur through a section containing a Rockwell indentation Readings across the test piece, instead of lengthwise, showed only a few points variation in hardness. The hardness across the sections quenched in salt were more uniform than those quenched in oil. Strength readings on Fig. 4 of the samples obtained by the salt quench are the most valuable and accurate of all the data, for they show in all sections over two pieces, higher strength values for the surface than the center pieces. For the 3-piece section hardness increase from one steel to the other rises by very uniform steps not shown in the oil quenched and drawn tests.

Fig. 4—Here is shown relation of hardness to strength


RELATION OF HARDNESS TO STRENGTH
GRAPH No. 3
ROCKWELL C HARDNESS
— QUENCHED IN SALT AT 625 DEG. F. FOR 15 MIN.
— QUENCHED IN OIL AND DRAWN AT — 625 DEG. F. FOR 1/2 HR.
C. Mn.
1 .38 .68
2 .38 .66
3 .38 .78
STRENGTH ABOVE HARDNESS EXCEPT 3 VALUES ENCIRCLED
NUMBER OF PIECES MAKING UP SECTION

♦

Synthetic Rubber Used For Well Drill Bearing

■ Oil well drillers determine geological strata by cutting cores from bottom of well, bringing them to the surface and actually inspecting formation at point where drilling is taking place. The larger and more perfect the core, the more complete the information obtained. If core catcher imparts torsional strain to core, it will destroy it and physical record of strata will be lost.

In order to obtain cores as perfect as possible, Reed Roller Bit Co., Houston, Tex., has designed a core drill having a non-rotating inner barrel and core catcher. An efficient bearing was required to prevent transmitting rotary motion from outer barrel to inner barrel and core catcher. Since bearing could be lubricated only by circulated fluid used in drilling, which might be water, mud or oil depending upon drilling position, bronze or rubber bearings could not be used successfully. Bronze bearings could not be properly lubricated by water or sludge, and rubber bearings were ruined by oil. Problem was solved by use of a neoprene bearing, which could be lubricated by oil, water or sludge. An inherent property of neoprene, chloroprene rubber made by E. I. du Pont de Nemours & Co., Wilmington, Del., is ability to resist deterioration by oils. In addition, it exhibits the strength, abrasion resistance, elasticity and resilience of rubber.

Drillers find this synthetic rubber bearing functions efficiently with any lubricant

Publishes Compressed Air Trade Standards

■ Completely revised in the light of recent developments, the fifth edition of Trade Standards has just been published by Compressed Air institute, 90 West street, New York.

For many years this publication has been an authoritative summary of nomenclature and terminology relating to air compressors, giving standards for rating, testing, installation and care of all types of so-called displacement compressors. Since publication of the fourth edition in 1930, the institute has broadened its field of activity to include not only air and gas compressors, but also apparatus of various types operated by compressed air. The new edition has been extended to include these fields. Copies are obtainable from the institute at $1.

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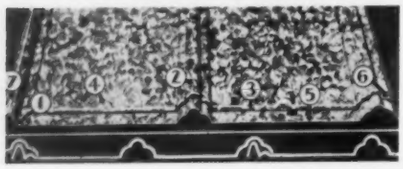
UNITED STATES STEEL

NEW METAL PRODUCTS

■ To prevent rusting out of sheets at overlaps and to overcome the force of capillary attraction, Newport Rolling Mill Co., Newport, Ky.,

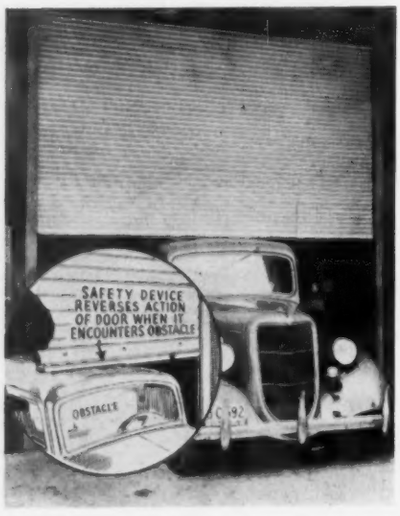


has designed its new Globe Rain Drain sheet metal roofing with an air lock (3) in the path of water as it rises.

Water that may be blown up under sheets at side laps is conducted to eaves by the drain channel (1), rolled into the outer crimp. Other interesting points of design include: Improved triple dome crimp (2) nail seat (4), rolled into air lock bead to provide for extra nailing; snug fit edge (5), bent downward ⅛-inch to form pressure contact with under sheet; self-aligning ridge (6), a continuation of air lock bead; and (7) almost vertical supporting leg under overlapping crimp, which provides greater rigidity for nailing. Matching ridge roll, flashings and other fittings are produced with similar features.

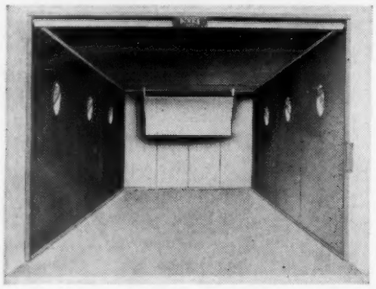
■ Safety is the principal feature of a new line of motor-operated rolling steel doors, just introduced by Kinnear Mfg. Co., Columbus, O. Through application of an automatic device, danger of injury to persons or cars by accidental closing of doors is largely eliminated.

A compressible, air-containing weatherstrip is placed along entire length of the bottom edge of the door. If door contacts an obstruction upon closing, it compresses this weatherstrip, forcing air through an impulse switch and causing door either to stop or revert to its fully open position. Precision and rapidity with which device operates may be judged from the fact that a man can allow a door to come down on his head with little discomfort.



■ Designed for use where maintenance of a large fleet of trucks or cars is a problem, a new line of auto spray booths has been announced by Binks Mfg. Co., 3114 Carroll avenue, Chicago.

Booths are constructed of 22-gage sheet steel sectional panels, reinforced with a spot-welded angle steel frame. User may purchase booth in units, increasing flexibility of application. He may obtain top and one side only, or a top and two



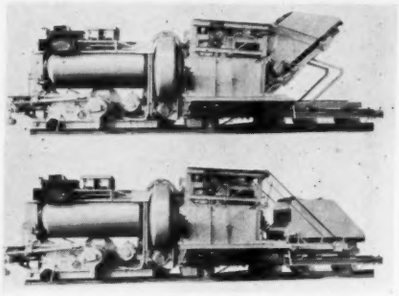
sides, utilizing his own walls as part of the spray booth. Top, back, right or left side exhaust can be furnished.

■ Characteristic asymmetric spread distribution of light is utilized to full advantage by a new series of indirect aluminum lighting units, known as MB Luminaires, designed specifically by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for use with incandescent Bipost lamps. Special reflector-basin design makes these fixtures equally effective for low ceiling heights and general commercial lighting applications.

Construction consists of a canopy drawn from 18-gage aluminum; the stem, a one-piece aluminum tube; husk assembly, consisting of a husk and shield ring welded together; standard socket; basin, consisting of outer reflector spun from 18-gage aluminum and inner reflector spun from 14-gage aluminum, both of which have a semi-diffuse reflecting surface. Units are available in two sizes, 500-watt and 750-1000-watt.

■ The 7-mile length of the new Gunpowder Falls-Montebello tunnel, which is part of Baltimore's water system, will be lined with 70,000 cubic yards of concrete by two Rex tunnel lining machines such as the one shown here.

Designed and constructed by Chain Belt Co., Milwaukee, each of these machines consists of two

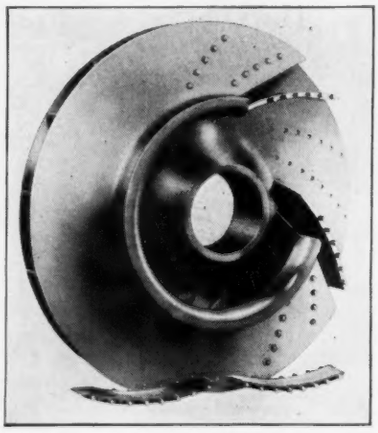


separate cars, a mixer car weighing 18,000 pounds and a Pumpcrete car weighing 16,000 pounds. A batch car, shown at right, charges the mixer. After mixing the concrete in 1½-cubic yard batches, mixer discharges it directly into a transfer drum on the Pumpcrete car. From here concrete is discharged into the Pumpcrete machine and is pumped through an arch pipe into the forms.

■ Interesting structural features are apparent in this sectionalized impeller wheel for turbo-blowers. A product of Allis-Chalmers Mfg. Co., Milwaukee, this highspeed, chromium-vanadium forged steel, built-up wheel is enclosed type, with blades curved away from the direction of rotation. Hub disk and cover disk are machined from single-piece forgings, heat-treated to give maximum strength consistent with ductility.

Blades are forged, heat-treated chromium-vanadium steel plate, cut to rough size and milled out on the sides. After machining, blades are cold bent to shape. Riveting is done cold, by hand, for proper alignment.

For special applications, stainless steel can be substituted for chromium-vanadium in construction of these impeller wheels.



ADVERTISING PAGES REMOVED

Safe Practices

Welding and cutting operations involve a consideration of several important precautions. Those most essential for adequate safety to workmen and property are detailed

■ WELDING with either a torch or electric arc obviously is an open-flame operation. Consequently welding by either method, or gas cutting, should not be undertaken in any place where it would be forbidden to light a match or otherwise set up a force of ignition.

In addition to observing precautions when lighting a torch or striking an arc there are other factors involved in the safe use of welding and cutting equipment. In fusion welding, sparks and hot slag are formed and these molten globules of metal and metal oxides will fly appreciable distances. Also the hot stub ends of rod may be dropped. Since such hot materials may start smoldering fires, precautions must be taken to prevent them from lodging in combustible materials in the vicinity of the operation or in cracks of wooden floors. When welding or cutting at elevated points in building structures, special precautions against falling or flying hot metal and sparks must be taken. It is almost impossible for the operator himself to know where these hot particles are going, so a competent person should be on watch. In any case, area in immediate vicinity should be carefully examined after such work to be certain there are no smoldering fires.

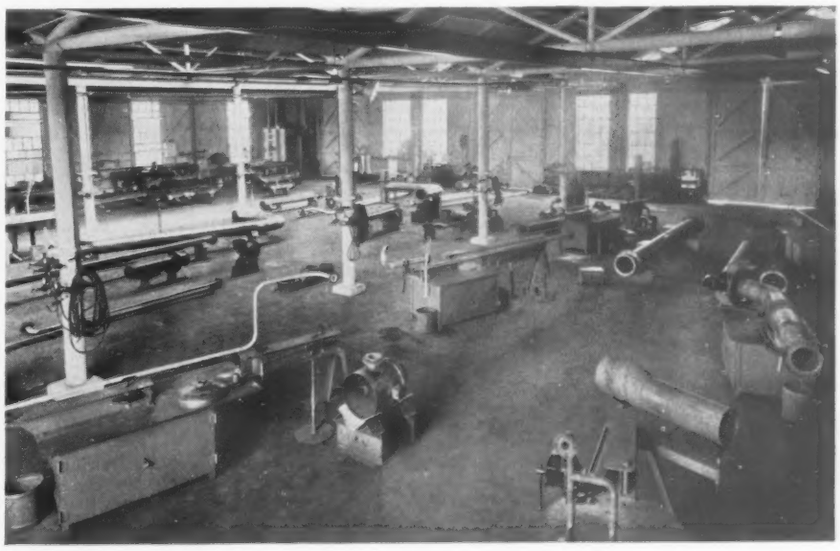
Although not a fire hazard, it is important that precautions be taken against bursting of a container, hollow casting or similar structure not vented during welding or cutting operations, even though such articles may be small and the unvented space involve only a few cubic inches. The increased temperature will develop a pressure which may exceed bursting strength of the walls, which is reduced by heat incident to the operation. To guard against this, containers should be vented at a regular opening and a hole should be drilled in any hollow objects where no cap or plug can be removed to provide a vent.

In working on containers there is always the possibility that combustible gases or vapors may be present. Unless removed before beginning work, this is a serious hazard. This fact is generally recognized and such containers first given a certification of safety by competent inspectors in practically every plant in the metal fabricating and repair industry.

Due to large size of compartments in oil tankers, double bottom of oil burning vessels, inside of gas holders and large pressure storage tanks, fires or explosions would be of major magnitude in such places, and therefore this element receives careful attention. However, it must be remembered that small containers such as barrels, gasoline tanks and drums offer the same hazards.

Fortunately there is a safe inexpensive way in which small containers can be prepared. First step after cleaning and flushing out is to place container so part to be worked upon is uppermost. Container then is filled with water to within an inch or two from point where heat

Abstracted from October, 1938, issue of "Oxy-Acetylene Tips", published by The Linde Air Products Co., New York.



Clean floors, good light and ventilation, and adequate room make this a model welding shop

Typical equipment used in testing for combustible atmospheres

is to be applied. The water reduces space in which gas or vapors might collect and also keeps the container from overheating and so reduces possible volatilization of any residues which might be present.

Containers are frequently steamed to purge them. Caustic solutions aid in removing grease and oil. Carbon dioxide or nitrogen is satisfactory for purging tanks provided that the air in the container has been displaced to a point where ignition cannot occur. This can be determined by a gas analysis and it must not be assumed that a certain quantity of inert gas placed in a container will adequately purge it. Even with efficient methods for changing atmospheres, it has been found that four to five times the volume of the container must be supplied to make composition of resulting atmosphere entirely safe.

Combustible gas detectors are available which quickly determine the presence of explosive mixtures. A test prior to welding, however, does not mean combustible gases or vapors may not be generated when heat is applied. Therefore additional tests should be made at frequent intervals.

Another hazard not generally considered is a deficiency of oxygen which may result from welding and cutting operations in confined spaces since such operations seemingly require such small amounts of heat. The familiar Davy lamp may be used to indicate insufficient oxygen in the air.

Adding Oxygen Dangerous

Oxygen from cylinder or pipe lines should never be added to confined spaces in an effort to compensate for oxygen consumed, because increased oxygen concentration materially adds to the possibility of igniting clothes or other combustible materials.

Safe practices in welding and cutting include proper care and use of apparatus. Equipment should comply with underwriters' standards and preferably be of a type specifically approved by underwriters' laboratories.

Safety precautions concerning use of oxyacetylene equipment are based on two important characteristics of oxygen and acetylene that always should be kept in mind: Acetylene is a combustible gas and so may form explosive mixtures with air or oxygen; oxygen although not inflammable is a strong supporter of combustion and under high pressures such as exist at cylinder valve openings may react spontaneously and violently with oil or grease.

Regulators used with gas cylinders should always be protected against small particles of dust getting inside and interfering with efficient operation. Before a regulator is attached to a cylinder, the cylinder valve should be opened for an instant to blow out any dust or dirt that may have accumulated in the valve opening. Dust plugs provided with regulators should be kept in place over the connections whenever regulators are not on a cylinder.

Since a sudden rush of high pressure gas through the valve opening may strain the regulating mechanism and cause a leak, cylinder valves must be opened slowly after the regulator has been attached to the cylinder. Always release pressure adjusting screw on regulator before opening the cylinder valve. Use only soapy water in testing for leaks. Regulators should be inspected at frequent intervals by someone familiar with their operation.

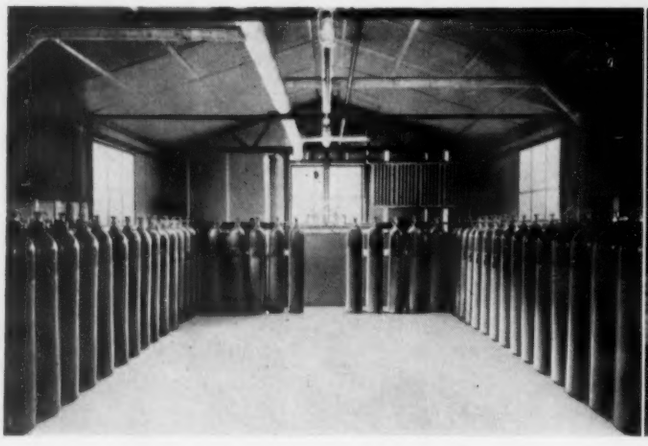
Pneumatic hose should not be used for welding or cutting, as oil or grease may be present to cause trouble. Long lengths of hose also should be avoided, but where necessary care should be taken to keep hose from becoming tangled or kinked. No white lead, grease or pipe fitting compound of any kind should be used in making connections.

How To Repair Hose

Correct method to use in repairing welding or cutting hose is to cut the hose and insert a union. Repairs with tape should never be attempted. After leaks have been prepared and connections tightened, blow out hose to remove any particles of lining that may have worked loose. About every two months it is advisable to cut off two inches at each end of hose and replace connections.

Any portion of a hose burned by a flash back should be discarded, as carbon particles may be carried into the torch to cause trouble.

Torches must be lit according to manufacturers' directions. Clogged tips must be cleaned by using prop-



Well-planned installations, such as that at left, contribute to safe and efficient operation. At right, a protective shield is being used to guard floor against slag and sparks

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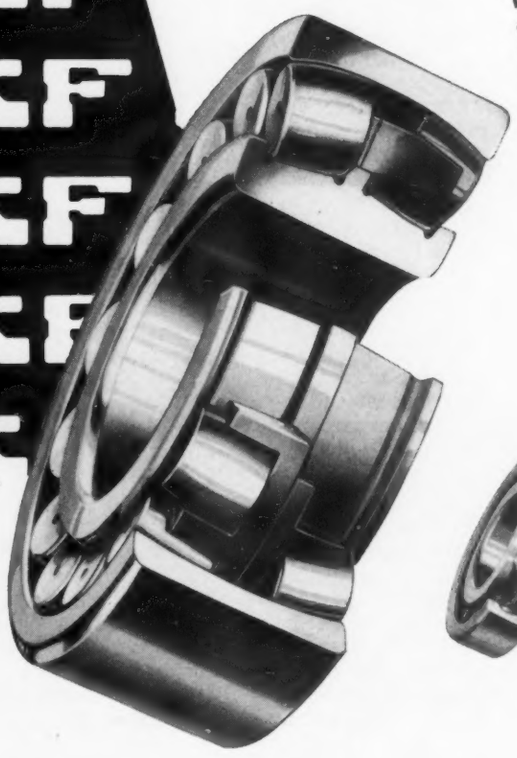

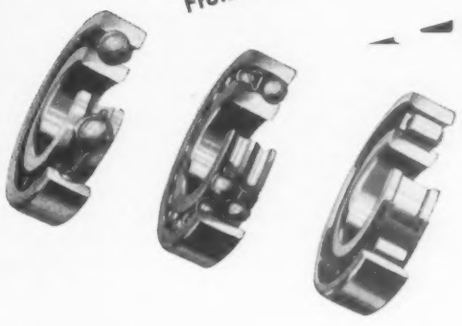

SKF makes more types and sizes of ball and roller bearings than any other manufacturer in the world.

er size drill. Weld heads, tips and cutting nozzles always should be seated tightly as misadjustments here are the usual cause of leakage. In case of a flash back, immediately close oxygen valve of torch and then close acetylene valve. After a moment relight the torch in the usual manner. Never put down a torch unless oxygen and acetylene valves are tightly closed.

Important precautions to observe in handling compressed gases follow: Prevent cylinders from falling from any height or striking each other violently. Use only a cradle or suitable platform when transporting cylinders with crane or derrick. Never use a magnet or sling. Do not use cylinders as rollers or supports even if empty. Place cylinders where they will not come in contact with hot slag or flame. Fasten cylinders securely during all handling operations. When working on scaffolding or similar locations, it is desirable to leave cylinders at ground level with an attendant and to use sufficient hose to reach the point of operation.

Principal factor in storage of cylinders is to avoid a source of heat. Also protection against falling or passing objects should be provided. Somewhat elemental but nevertheless frequently disregarded is the use of adequate clothing to protect the operator against heat and hot metal. Woolen clothing is preferable to cotton because it is not so readily ignited and helps protect the workmen from changes in temperature. Correctly designed goggles of course are essential.

Oxygen Not "Air"

Serious accidents have been caused by a misunderstanding resulting from calling oxygen "air" and calling oxygen under pressure in a cylinder "compressed air." Compressed air is used to start diesel engines. Oxygen never should be used for any such purpose. Do not use oxygen in pneumatic tools, in oil preheating burners, to blow out pipe lines, to "dust" clothing or work, or for pressure in a tank or device of any type.

Space limitations do no permit a complete review of all safety practices, so the following list is presented to those seeking complete information:

"Precautions and Safe Practices in the Storage, Care and Handling of Oxyacetylene Welding and Cutting Equipment," form 2035 and "Preventing Welding and Cutting Fires," form 3382, available from The Linde Air Products Co., 205 East Forty-second street, New York. "Safe Handling and Use of Compressed Gas Cylinders," rules of the Compressed Gas Manufacturers' association, 110 West Fortieth street, New York. "Safe Practices for Installation and Operation of Oxyacetylene Welding and Cutting Equipment," published by International Acetylene association, 30 East Forty-second street, New York. "Gas and Electric Welding," bulletin No. 23, and "Safe Practices in Handling Compressed Gases," bulletin No. 95, published by National Safety council, 20 North Wacker drive, Chicago. "Regulations of the National Board of Fire Underwriters for the Installation and Operation of Gas Systems for Welding and Cutting," available from the National Fire Protection association, 60 Batterymarch street, Boston. "American Welding Society Tentative Recommendations Describing Procedure to be Followed in Preparing for Welding or Cutting Certain Types of Containers Which Have Held Combustibles," published by the American Welding society, 29 West Thirty-ninth street, New York.

◆

Reports Progress Made In Combating Corrosion

■ From 50 cents to $1 a ton is the approximate cost of providing corrosion protection to the estimated one billion tons of steel and wrought iron products in use. This staggering amount spent in the battle to combat corrosion was named by Dr. Frank N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, in addressing the Cleveland District committee of the American Society for Testing Materials in Cleveland, Nov. 30.

Corrosion is an electrochemical action which in itself is simple, but numerous secondary factors enter to make the problem a complicated one, the speaker stated. The severe toll can be reduced considerably through use of alloy steels, protective coatings, cathodic protection, de-aeration of water, and use of metaphosphate of soda in water with which steel and wrought iron products come in contact.

In 1926, the oil industry, which has a particularly severe corrosion problem, started a study of the subject and the solution, and by the beginning of the depression had made sufficient progress to estimate it had saved 1 cent a gallon on its oil products. Mr. Speller said that today one-half of the tubes used in the petroleum industry are alloy steel containing 3 per cent chromium with some molybdenum.

Referring to ship construction, he said that use of the high-strength, low-alloy steels, except for structural members, is improving corrosion-resistance, and at the same time is permitting a 10 per cent reduction in deadweight with corresponding increase in pay load.

Keeping steel clean by removing anodic deposits, especially in tubes and pipes, cuts down localized pitting, and hence, increases life of steel. Painting is a good protective measure against corrosion, but for best results the surface must be prepared properly. Mr. Speller cited the painting of ship bottoms in which the surface is sandblasted, blown off with dry air, and painted immediately with a mixture of red lead, tung oil and mixed chromates. After 5 years, steel treated in this manner continues to afford protection against corrosion with only a single coat of paint.

Cathodic protection, in which a small electric current is impressed on the steel network, provides good corrosion resistance. However, the effect is increased if a thin coating of asphaltum also is employed. Use of the thin coating, say about 0.1-inch, with cathodic protection costs about one-fifth that of providing the proper heavy asphaltum coating.

The speaker said he believed that if the corrosion maintenance of long gas pipelines could be reduced to a low point, more lines would be installed to distribute natural gas now going to waste in the Southwestern fields.

De-aeration of water has accomplished a great deal in reducing corrosion. Likewise has the use of metaphosphate of soda which raises the saturation point of salts in water, and thereby prevents precipitation on the surface of steel and iron of those salts which promote localized pitting.

Silver Recommended as Food Container Lining

■ It is concluded in a report of a recent research project sponsored by a group of silver producers that the real immediate opportunity to develop a tonnage use for silver lies in the field of coatings.

The study indicates that this metal is especially suitable for handling food stuffs, beverages and chemicals. Silver's resistance to a variety of corrosive substances makes it suitable for lining cans, barrels and shipping containers. It is believed silver-lined containers can be developed at a reasonable cost to satisfy requirements of makers and users of quality products.

To this end an intensive study is being made at the national bureau of standards, Washington, of methods for producing impervious thin silver coatings which will offer the metal's protective qualities at a minimum cost.

One-Fire Porcelain Finish Is Developed

■ Porcelain Enamel & Mfg. Co., Baltimore, recently announced a One-Fire finish, using Pemco V-134 frit. This inexpensive finish is said to have good luster, attractive appearance. It can be sprayed over the bisque ground coat. It was developed principally to give a low cost finish of durable character for inexpensive merchandise.

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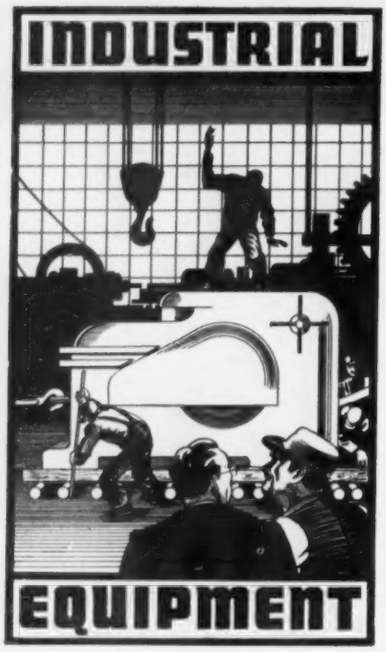


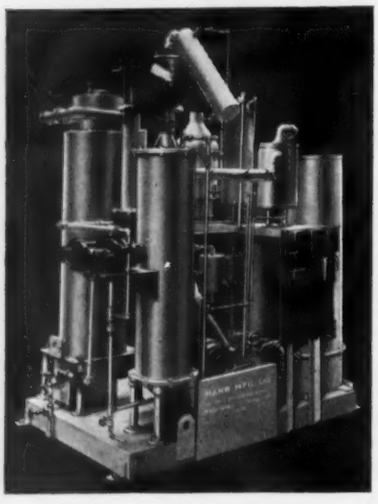
Produces High Purity Nitrogen Economically

■ Mahr Mfg. Co., division of Diamond Iron Works Inc., Minneapolis, has developed a compact nitrogen generator for low-cost production of non-explosive, non-toxic, chemically inert furnace atmospheres for use in the heat treating of metals.

Generator consists essentially of: A combustion chamber with a special permix burner and precision flow control valves; a condenser for removing moisture formed in process of combustion; a carbon dioxide absorber; a stainless steel heat exchanger system for regenerating the absorbing medium and using it over and over; and a group of regenerative driers for removing final traces of moisture down to a dew point of 45 degrees Cent. below zero.

Combustion chamber is so designed that combustion is completed at high temperature to form stable products of combustion, and is water-cooled to lower temperature of gases for handling in the remainder of the equipment. Burner operates with manufactured, mixed or natural gas. Carbon dioxide absorber has a patented motor-driven gas diffuser to accomplish scrubbing without use of high towers.

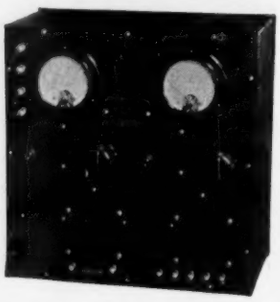
Nitrogen is produced by this equipment at a purity of 99.8 per cent, according to the manufacturer.



Measures Duration of Electrical Impulses

■ Raytheon Mfg. Co., Waltham, Mass., has devised an instrument for measuring duration of electrical impulses in alternating current circuits. Known as the RayTimer, this device may be calibrated in either cycles or seconds and covers with equal precision excitation periods from 1/120-second to 30 seconds, accuracy being plus or minus 5 per cent.

Instrument is a simple electronic unit with no moving parts except the indicating pointer and no maintenance other than occasional replacement of vacuum tube. Illustration shows double unit having two instruments assembled in one container for convenience in measuring two different impulses simultaneously.

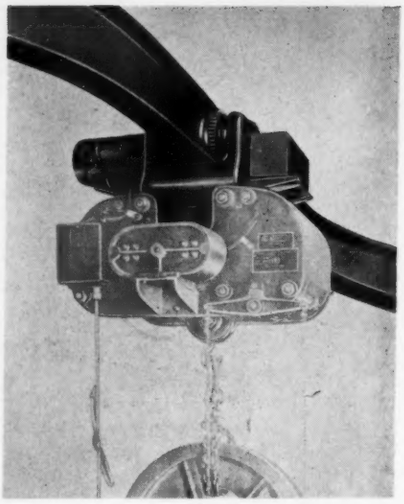


This device is used for checking welder and X-ray exposure timing, measuring the closing and opening time of relays and contactors, measuring time periods and operating speeds of mechanisms having electrically actuated sequences.

Motor-Driven Trolley Has Four-Wheel Drive

■ American Engineering Co., Philadelphia, has announced a new motor trolley, called Type RB, for use with its line of Lo-Hed hoists.

Trolley is a separate unit, sold either in combination with Class B hoist or separately for converting any present hoist of the bolt suspension, plain trolley or hand-geared trolley types to the motor-driven trolley type. Short wheelbase, low headroom, four-wheel drive and good balance are features of this trolley. It is said curves with radii as low as 7 feet can be negotiated easily. Headroom varies from 1 foot 9 inches to 3 feet 10 inches, depending on capacity of hoist and height of lift. Balance is secured by means of an adjustable counterweight.

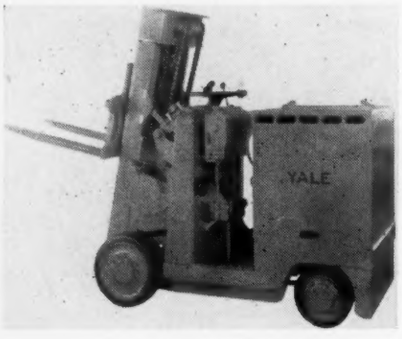


Gear-driven trolley wheels are cast steel with machined rolling surfaces. Motor is fully enclosed and is designed especially for trolley service. Drum-type, fireproof controller is operated by pendant cords, and special controls are available.

Center Control Truck Features Greater Safety

■ Yale & Towne Mfg. Co., Philadelphia, has introduced a center control tilting fork truck, known as Model K41, featuring greater maneuverability, operator visibility and safety.

Truck has a minimum overall height of 83 inches and is capable of elevating forks to a maximum height of 102¾ inches, which means truck can pass through 7-foot doorways and yet stack to ceiling height. Forks are elevated by two independent roller chains directly driven by triple reduction spur gears. Up-



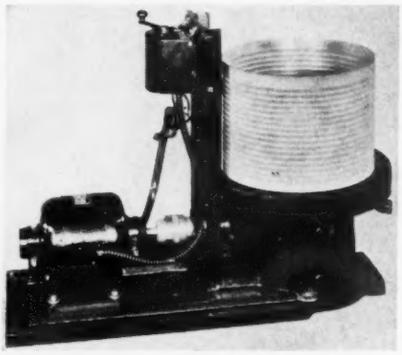
right channel frame is tilted back 10 degrees and forward 5 degrees by two heavy duty racks which pass over driving pinions. Main drive of truck is a double reduction bevel and spur gear. Truck has a compartment that will contain a battery having a maximum rating of 24 kilowatt hours.

Truck illustrated has a capacity of 5000 to 6000 pounds, but this same type is available in capacities ranging from 1500 to 20,000 pounds.

Electric Blower Added To Centrifugal Dryer

■ Hanson-Van Winkle-Munning Co., Matawan, N. J., has incorporated a Garden City blower in construction of its Mercil type centrifugal dryer for metal products and parts.

Blower is direct connected to a



¼-horsepower motor. A 6-inch pipe line is welded to the cover and extends over to the blower to a point where it can swing out in a horizontal position. Cover is simply lifted and swung out of the way to load and unload basket of work. Electric heating elements are inserted in the pipe line directly above opening in the cover.

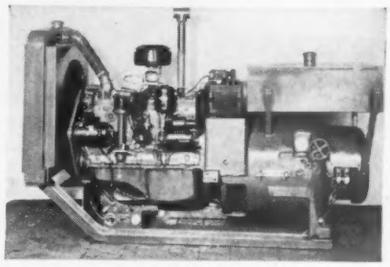
It is said a batch of 30 to 60 pounds of small work can be dried by this equipment in one or two minutes.

Engine Driven Welder Designed for Field Use

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a 200-ampere gasoline engine driven welder for field and rural service where power supply is not available.

Designated as FlexArc model SFA, this welding unit is equipped with governor, hydraulic idling device, current indicator, polarity reversing switch, oil filter and is arranged for battery starting. No meters, rheostats, reactors or other instruments requiring frequent maintenance are used.

Current output is varied by means of a magnetic shunt in the armature reaction flux path of the generator. A handwheel on side of the generator is turned for adjustment



to any desired current setting. Power unit is a Chrysler model T50 industrial engine, which has a fuel consumption of 2 gallons per hour when set is operated continuously on a 200-ampere load.

Announces New Line of Small Size Swing Joints

■ Chiksan Oil Tool Co., Fullerton, Calif., has announced a line of ¾-inch and ½-inch ball bearing swing joints, designed for use in machine shops, die casting, rubber and plastic molds and for any application that requires a small flexible joint.

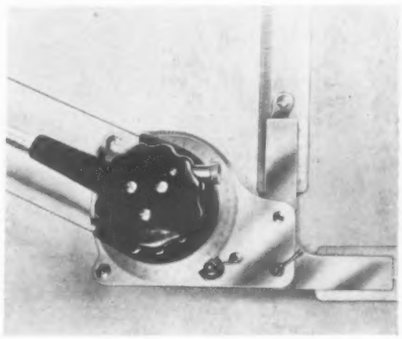
Construction is same as that found in larger sizes. Joints are steel with full openings for their respective sizes. They give complete 360-degree rotation without binding, rotating freely on double rows

of hardened steel ball bearings. Grease is sealed off from contact with contents of the line. Low-pressure models are tested to 300 pounds, while high-pressure models are tested to 4000 pounds, with ample safety factor allowed. Joints are made in three styles for various rotating actions and have standard pipe thread connections.

Touch Control Drafter Is Smooth and Accurate

■ Charles Bruning Co., 100 Reade street, New York, has devised a drafter featuring "touch control", a new method of controlling the protractor head. This is said to improve the speed, smoothness and accuracy of the drafting process.

Control button is located on the protractor head, conveniently under draftman's thumb. A touch of this button releases the head, allowing it to rotate freely to the desired setting. Lifting the thumb locks



head at desired automatic index stop.

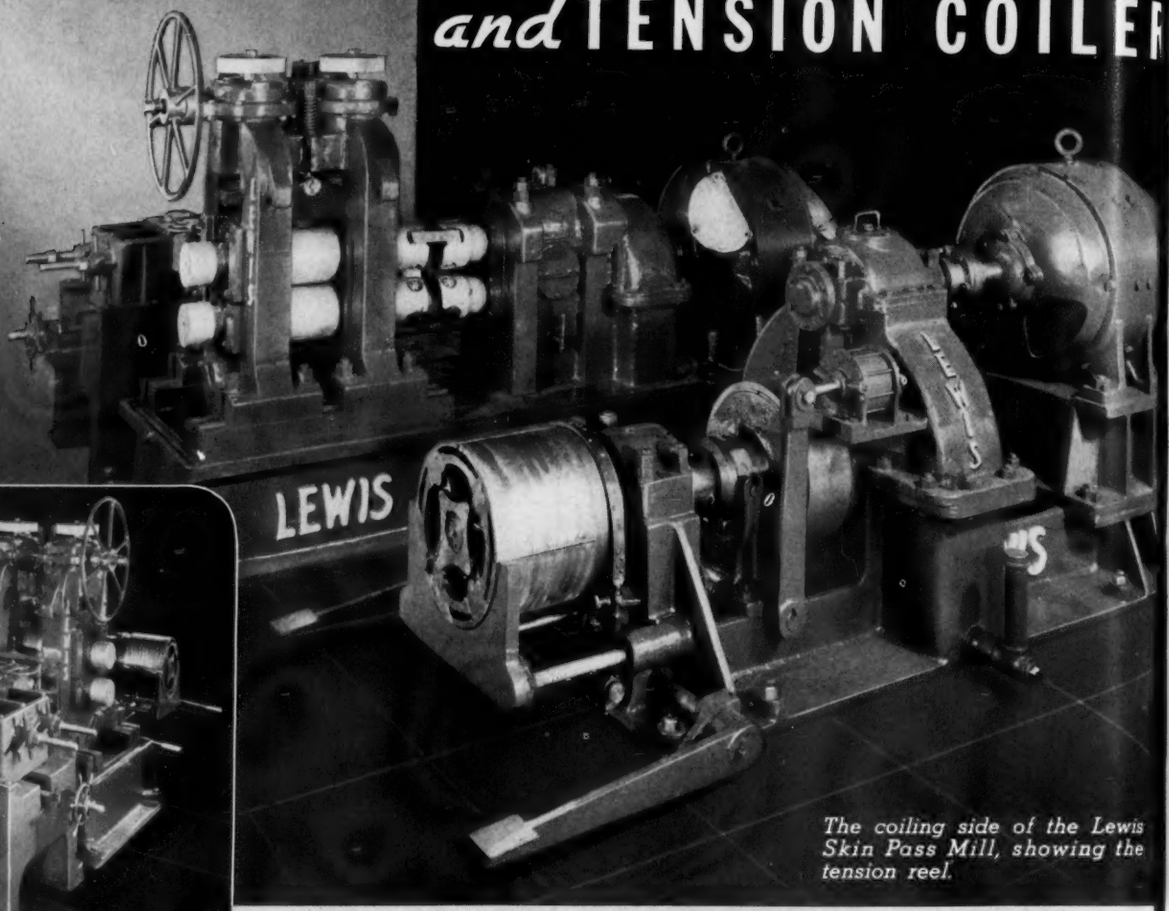
Drafter is designed especially for use of mechanical, architectural and structural draftsmen. Full circle protractor is graduated throughout in degrees, and automatic index stops are provided at 0, 30, 45, 60 and 90 degrees in each quadrant. Double vernier reads to 5 minutes. Scale lineup adjustment permits scales to be set accurately to correspond to lines previously drawn instead of lining up the drawing to scale.

Corrects Variables of Atmosphere Generators

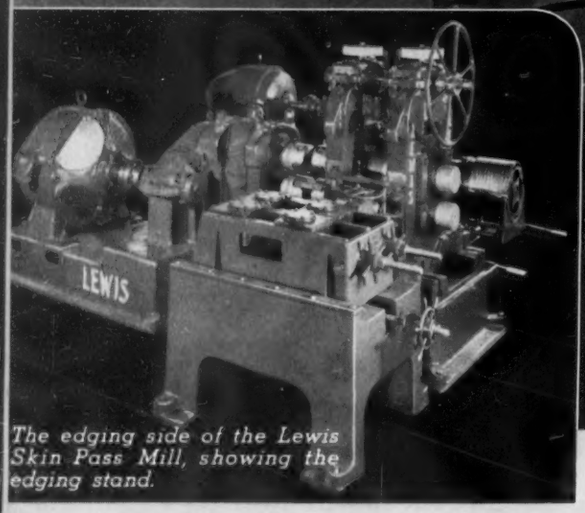
■ C. M. Kemp Mfg. Co., 405 East Oliver street, Baltimore, has provided for bright annealing protective atmosphere generators a control system that fulfills need for automatic correction of variables. Designated as the Constant-Analysis Monitor, this device assures desired analysis constantly by compensating for changes in specific gravity of fuel gas, thermal value of fuel gas and variation in combustion air supply.

It functions by continuously sampling bright annealing gas as it is generated, passing this sample

LEWIS SKIN PASS MILL *with* EDGING STAND *and* TENSION COILER



The coiling side of the Lewis Skin Pass Mill, showing the tension reel.



The edging side of the Lewis Skin Pass Mill, showing the edging stand.

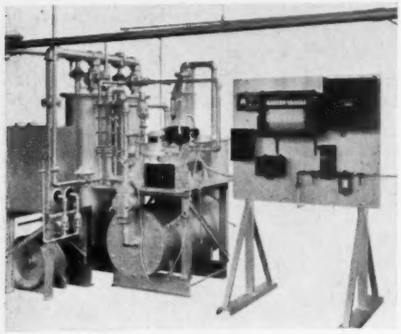
THE LEWIS SKIN PASS MILL cold rolls and edges pre-slit strip and coils it on the delivery side. It enables strip to be rolled at speeds of from 400 to 1200 F.P.M., and delivered accurately edged to meet specifications having close tolerances.

This Lewis Mill is made for brass, copper, aluminum and other non-ferrous metals – as well as steel strip. It is built to conform to the well-known **LEWIS** standard of quality.

Complete details and prices will be sent you upon request.

LEWIS FOUNDRY & MACHINE
DIVISION OF BLAW-KNOX CO.
PITTSBURGH, PA.

through a thermal conductivity analysis cell. This cell develops a potential which is a measure of the composition of gas as produced.



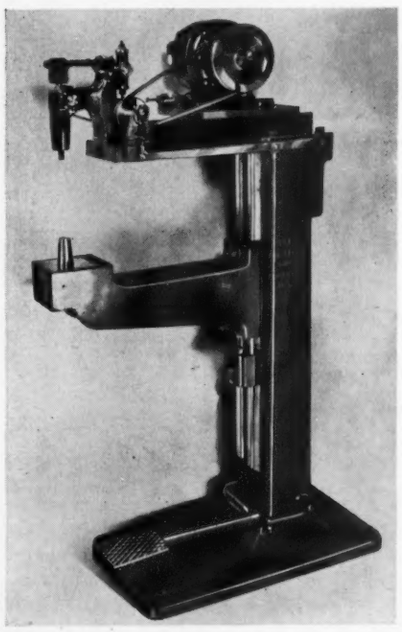
Potential is indicated and recorded by a controlling potentiometer.

When atmosphere generator is placed in operation, desired analysis, having been set by manual adjustment of handwheel on the industrial carburetor, is maintained automatically from that point on by a motor geared to micrometer adjusting screw on the carburetor. Motor responds when energized through potentiometer in response to deviations in gas composition.

Riveting Hammers Have Wider Horizontal Gaps

■ High Speed Hammer Co., Rochester, N. Y., now offers ten sizes of riveting hammers for cold riveting up to 1½-inch solid rivets. Hammers have horizontal gaps suitable for handling parts with rivets located a great distance from edge of the work.

Latest additions to this line of hammers are the No. 1AA and No. 1½B sizes, complete range of which is up to ⅛-inch mild steel rivets. While standard gap of these units is 3 inches, the hammer illustrated has an 18-inch horizontal gap, and wider gaps may be obtained.

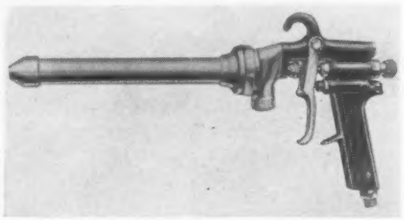


These machines are used for riveting turbine blades or buckets, wagon wheels, fire doors, agricultural machinery, aviation parts, etc.

Extension Spray Gun Seals Automobile Bodies

■ Binks Manufacturing Co., 3114 Carroll avenue, Chicago, has announced an extension spray gun, called Thor model No. 7-H, designed primarily for applying sealer to body seams on the under side of automobile bodies to prevent dust from entering car body through open cracks.

On upper body joints a ribbon of sealer is laid on the seam. Such a ribbon cannot be laid up against an underbody joint, sealer must be



sprayed up on to it. This is the purpose of the new gun. It is held about 6 to 8 inches below the seam and sprays a pattern about 2 to 3 inches wide. It also is ideal for sealing body seams in other places inaccessible for other types of guns.

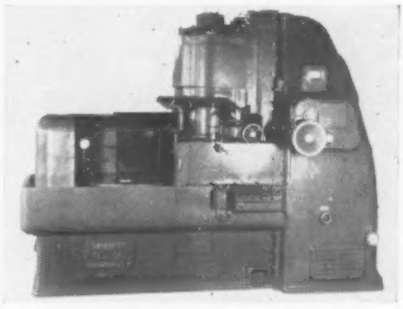
The new model is sold with extension nozzles varying in length from 4 to 10 inches.

Rotary Machine Built For Surface Grinding

■ Hanchett Mfg. Co., Big Rapids, Mich., has placed on the market a rotary surface grinder, designated No. 36, designed with a rotary work table mounted on a horizontal slide, which has rapid power traverse forward and back from the grinding wheel. Range of work diameter is 30 inches, with alternate 36 inches.

Magnetic chuck type work table has a speed range from 6 to 36 revolutions per minute and is driven through helical pinion and ring gear and supported on flat circular way extending to outside diameter of magnetic chuck.

Wheel head feed may be either manual or automatic and is variable from 0.004-inch to 0.080-inch per minute. Feed wheel is graduated in steps of 0.001-inch. There is a separate motor for rapid power raising and lowering, interlocking with wheel feed. Coolant reservoir

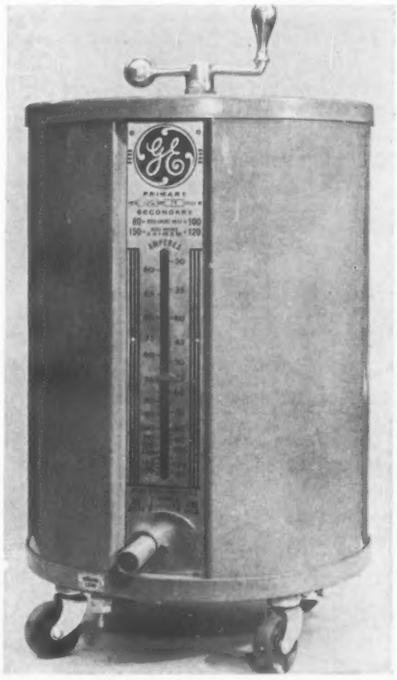


in bed of machine holds 175 gallons, and coolant pump has a 90-gallon capacity.

Ames work measuring gage is mounted in a dustproof case supported on an adjustable bracket. Grinding wheel motor is rated 25-horsepower at 700 revolutions per minute and is equipped with a built-in ammeter. Machine is 5 feet 8 inches wide, 10 feet 8 inches long, has a minimum height of 8 feet and a maximum height of 8 feet 7 inches, and weighs approximately 15,000 pounds.

Welder Has Spun-Glass Insulation Against Heat

■ General Electric Co., Schenectady, N. Y., has developed a 150-ampere alternating current arc welder of the transformer type for low-current welding with heavily coated electrodes. Although intended for use on light-gage metals, this welder's wide range, 35 to 180 amperes, per-



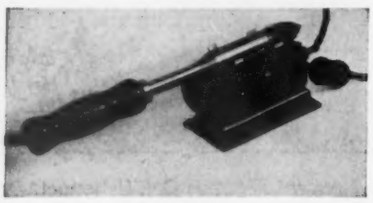
mits its use on fairly heavy materials.

Fireproof spun-glass insulation protects equipment from heat damage resulting from overloads. Solidly brazed internal connections eliminate possibility of open circuits. Continuous, stepless current control is obtainable by means of a handcrank, giving accurate adjustment of welding current to suit fine work.

A choice of two open-circuit voltages, 80 and 100, is provided to handle all types of alternating current electrodes. Welding lead can be quickly connected to either tap by means of a taper-bored connector. A circular cover plate prevents chance contact with terminals. Easy portability is provided by casters or by a hoist sling over the handcrank.

Soldering Stand Holds Irons at Constant Heat

■ American Solder and Flux Co., 4519 Wayne avenue, Philadelphia, has placed on the market an automatic device for keeping soldering



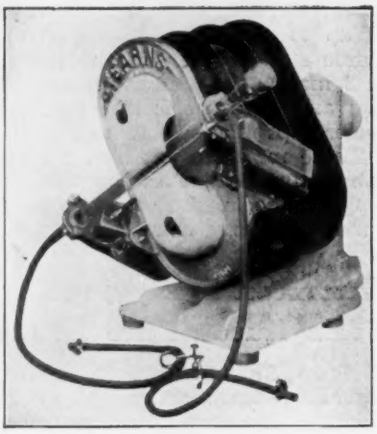
irons at a constant adjustable temperature.

Soldering stand with automatic heat control consists of a base containing a thermostatic switch and a simple bracket attached on top of this base to hold the iron. After soldering iron is placed on the stand, it is held at a constant temperature until removed, at which time full current is automatically turned on. Unit is readily portable and may be plugged into any electric outlet. Without adjustment, this device will handle all irons up to 2000 watts in 110 or 220-volt alternating current and up to 500 watts direct current.

Determines Magnetic Values in Ore Slurry

■ Stearns Magnetic Mfg. Co., Milwaukee, has announced a vibromagnetic analyzer, designed to permit accurate and rapid determination of magnetic values in various ore slurry. It may serve as a checking device on iron ore concentration equipment, and is suitable for use in mines, mills and university laboratories.

Unit consists principally of an ultra powerful direct current magnet and a magnetically vibrated



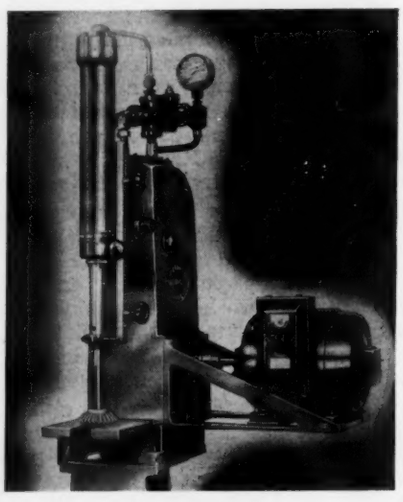
test tube, suitably located with respect to the poles, all mounted on a roller bearing pivot to permit tilting of magnet and tube assembly to any desired plane. Pedestal base is supported on live rubber insulators.

To cope with various slurry conditions, vibration amplitude can be regulated from 3/16-inch down to zero; and magnet strength can be regulated. Feed or concentrate samples containing up to one gram weight of magnetic material can be accommodated, and as many as twenty complete analyses can be made on this unit in an hour.

Bench Type Hydraulic Press Is Self-Contained

■ Greenerd Arbor Press Co., Nashua, N. H., has announced a 1½-ton bench type hydraulic arbor press for production pressing, broaching, assembling and burnishing. This self-contained press is cast in one unit of special semi-steel.

Pump and control valve are mounted in oil sump which is cast as part of main housing, and pump shaft is coupled directly to motor. Press has a 2-inch piston and 3 piston rings. Ram is 1½ inches in



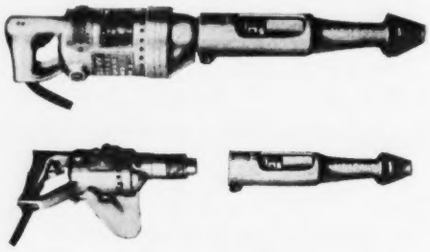
diameter and is packed with chevron type packing. Bottom of ram is machined with a ¾-inch hole, 1½ inches deep, and is equipped with a ram plug or nose. Pressure may be set from 50 pounds to 1½ tons.

Ram is put into motion by hand lever. Pressure will remain on work until lever is released, returning ram automatically to power stop which may be set at any predetermined point within stroke. Machined working table measures 8 x 8 inches and has a 2-inch slot.

Combined Hammer and Drill Is Versatile Tool

■ Wodack Electric Tool Corp., 4627 West Huron street, Chicago, has placed on the market a useful tool that combines an electric drill and an electric hammer in a single unit. Known as the Do-All, this tool has sufficient power for drilling ⅜-inch holes in metal and 1⅜-inch holes in masonry.

As an electric hammer, tool weighs 12 pounds. Hammer action



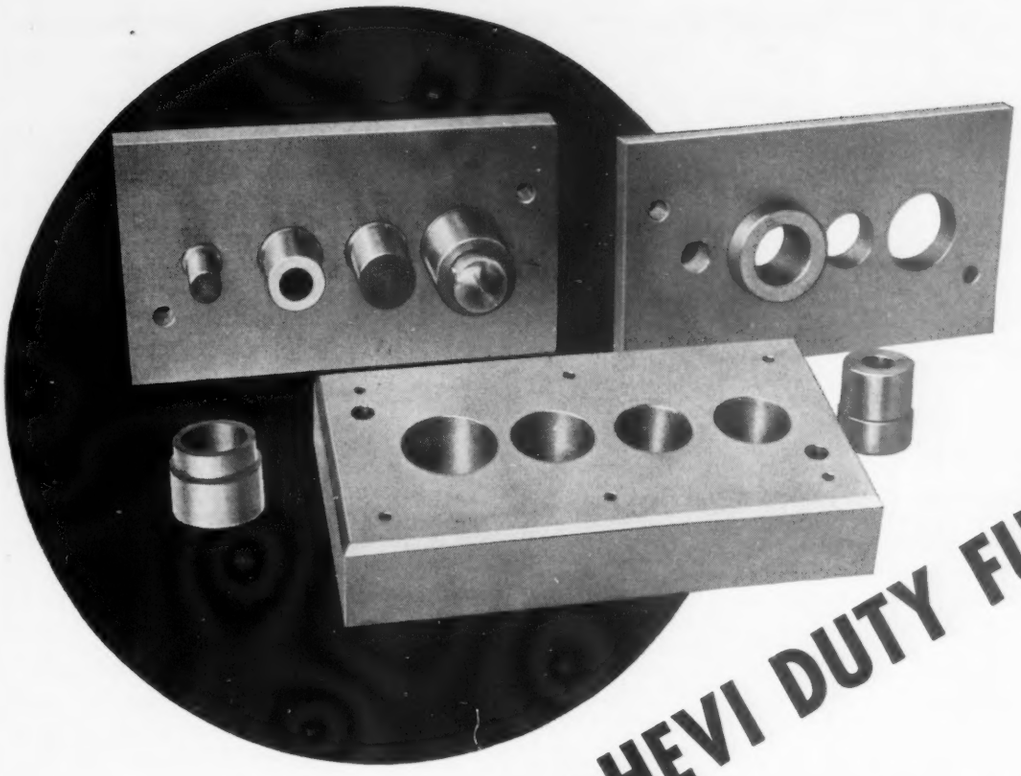
is obtained by a cam working against a heavy spring. It strikes 2400 one-hundred-pound blows per minute and drives star drills in concrete at an average rate of over 3 inches per minute. Changing from a masonry drill to a metal drill requires less than 60 seconds.

As a portable electric drill, tool weighs 7 pounds. Aluminum alloy body is strong and well designed. Drill has ball bearings throughout, fan ventilation, switch in handle, sealed lubrication and Jacobs chuck.

By the addition of a bench stand, drill member can be converted into a grinder or buffer, and a drill stand converts it into a bench drill press. Two models are offered, the MJA, described above, and the MDH, a slightly heavier tool with greater capacity.

Unit Heater Designed for Large Industrial Setups

■ Surface Combustion Corp., Toledo, O., has introduced a mammoth unit heater for installation in large industrial plants such as steel mills, finishing mills, assembly plants and foundries, where a high velocity of



SCHLAGE LOCK *and* HEVI DUTY FURNACES

In the manufacture of high grade locks the Schlage Lock Company, San Francisco, use a Hevi Duty Controlled Atmosphere Furnace for heat treating their important progressive dies. The temperature uniformity and positive atmosphere control of this furnace is the answer to many of their difficult die hardening problems.

An HDL 10187-C Controlled Atmosphere Furnace at Schlage Lock Co., San Francisco.

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI DUTY ELECTRIC EXCLUSIVELY

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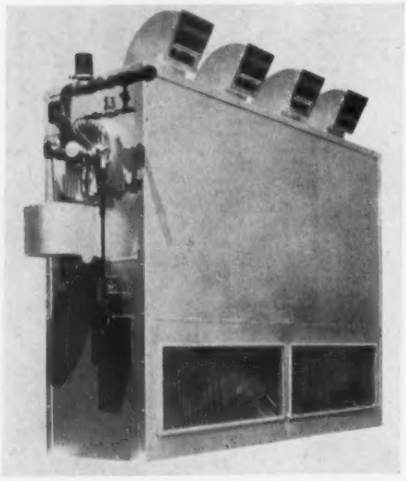
high temperature air is required to heat rooms with large floor areas and high ceilings.

Known as model F1250 SC, this gas-fired unit will operate on manufactured, natural, Butane or Propane gas. It has an input capacity of 1,250,000 B.t.u. per hour and an output of 1,000,000 B.t.u. Air delivery is 10,000 cubic feet per minute with an average temperature rise of 125 degrees Fahr. Air velocity is 2500 feet per minute, making possible a throw of approximately 175 feet with an outlet temperature of 175 to 185 degrees.

Heater is a floor type unit, 3 feet wide and 10 feet 9 inches long, making possible installation next to a wall or between columns without taking excessive floor space. It is 8 feet 3 inches high and weighs 5200 pounds. There are four air outlets, each equipped with horizontal louvres of adjustable type. Air is



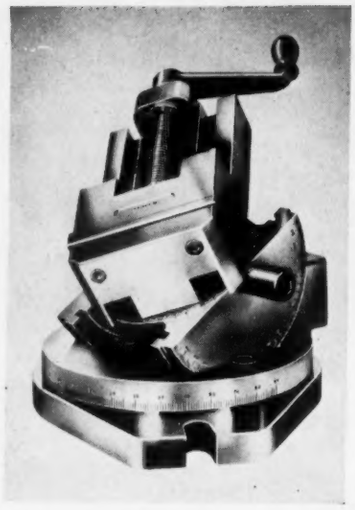
circulated by two large fans, and there is a third fan for delivering air to the burner.

Universal Vises Have Allsteel Construction

■ Wesson Co., 1050 Mt. Elliott avenue, Detroit, has placed on the market a universal allsteel vise, which is completely graduated on all three planes and will swing at a full 90 degrees on top and side planes and at a full 360 degrees on the bottom plane.

Jaws are hardened tool steel to insure maximum wear. Second plane is imbedded into body of first plane, thereby making vise more rigid, compact and 2 inches lower than the usual type of universal vise.

Vise is adapted for both grinding or milling machines and can be used either for top or side work. It permits a heavy milling cut, because cradle base guides extend above center line ¾-inch. Vise is

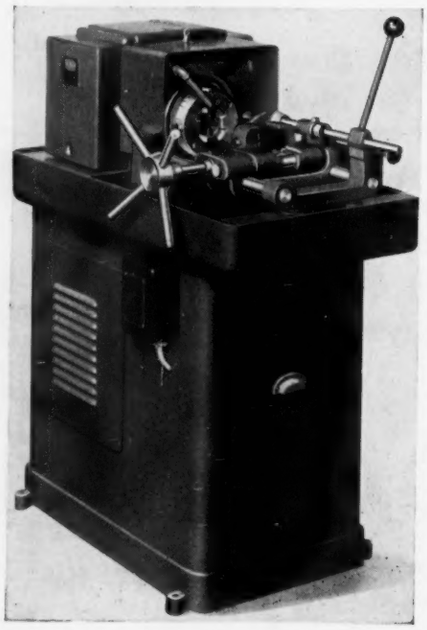


made in two sizes. No. 1 is 6⅛ inches high, has a maximum opening of 4 inches, weighs 46 pounds, and sells for $140. No. 2 is 4⅜ inches high, has a maximum opening of 15/16 inches, weighs 9 pounds, and is priced at $65.

Bolt Machine Adaptable For Other Operations

■ Oster Mfg. Co., 2057 East Sixty-first place, Cleveland, has added to its line of threading equipment a bolt machine, known as Rapiduction Junior, offered in two sizes, No. 541 for bolts up to 1¼-inch and No. 542 for sizes up to 1½-inch. When stripped of die-head and vise carriage, machines can be adapted for chamfering, reaming, boring, tapping and other operations.

Units are driven by constant speed 2-horsepower motors, and speed is variable through pickoff sheaves, from 27 to 386 revolutions per min-

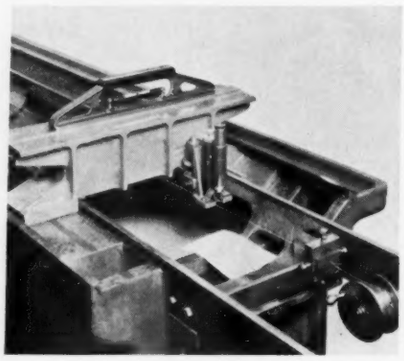


ute in eight steps. Drive from motor to machine is through V-belts, and final drive is by triple thread worm. Open type vise is operated by a handwheel, and jaws are adjustable both horizontally and vertically. Die-head is rotary type, automatic, quick-opening and fully adjustable for over and undersize threads. An adjustable, external tripping device can be set to open the head when thread has reached desired length.

Threading chasers are highspeed steel and are of the radius hobbed, segmental type, making possible replacement of one chaser without renewing entire set of four. Bed and base of machine are fabricated steel of sufficient thickness to give necessary rigidity to the unit. An automatic stock-stop is standard equipment.

Insures Accuracy of Grinder Way Alignment

■ Norton Co., Worcester, Mass., has placed on the market an instrument, called the Microliner, designed for



insuring straightness of V-ways on bases of long grinders. Device is used in construction of machines so that ways may be perfectly straight, and it is equally useful to owners of machines when setting up grinders on foundations in duplicating original accuracy of alignment and for checking alignment from time to time.

Equipment consists chiefly of a bridge of cast iron planed and scraped to correspond with the flat and V base ways, a microscope mounted on the bridge, a coil of music wire and clamps for holding wire in position. Microscope has an accurate scale graduated in thousandths of an inch across its optical field, illuminated by a built-in lamp.

Music wire 0.010-inch in diameter is stretched tightly from end to end of the base in a position so that microscope readings are alike at both ends. Bridge then is slid along the ways and readings taken every two or three feet. From the

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15%, 25-30%, 50%, 75%, 80-90%, 90-95%,

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High, Medium and Low Carbon Grades

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High Carbon Grade (4 to 6% carbon). Low Carbon Grades (from maximum .06% carbon to maximum 2% carbon). Iron Foundry Grade.

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ALSIFER
The Ferro-Silicon-Aluminum Deoxidizer

Also Other Alloys of Vanadium, Silicon, Chromium, etc.

•

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chart of readings corrections in alignment can be made by means of base adjusting screws.

Respirator Protects Against Organic Vapors

■ H. S. Cover, South Bend, Ind., has developed a rubber constructed respirator to protect lungs of workmen in atmospheres where injurious gases and fumes prevail.

Respirator is a twin-filter type, equipped with cartridges of special charcoal for organic vapors, soda lime for acid gases and copper sulphate for ammonia gas. Cartridges are easily removable and quickly replaced. Air filter apertures are back of the cheek location, and exhalation valve is close to mouth for positive exhalation of breathed air. Soft rubber facepiece gives an airtight fit. A face cloth is provided both for comfort and as a safeguard against dermititis.

Introduces New Bearing

■ Bantam Bearings Corp., South Bend, Ind., has announced a new type heavy duty needle roller bearing, designated as the standard quill bearing.

One-piece, rigid, channel-shaped outer race holds firmly a full complement of small diameter rollers. A spring steel band is employed to maintain rollers and outer race as a unit during assembly, but is not called upon to carry any load while operating. Rigid rib surfaces of outer race are hardened and ground, keeping rollers in perfect alignment.

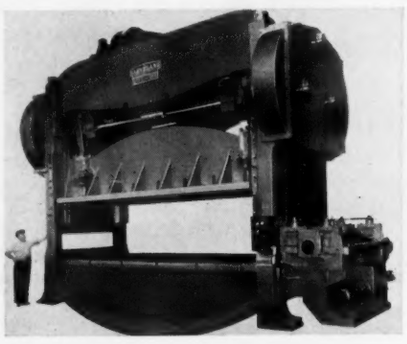
Load capacity is high, and space required has been reduced to a minimum, it is claimed. Design is simplified, and all fragile parts have been eliminated. These bearings are stocked in a complete range of sizes for shafts from ¾-inch to 5 inches. They are available either with or without inner races.

Press Operates with Automatic Roll Feed

■ Cleveland Punch & Shear Works Co., 3917 St. Clair avenue, Cleveland, has added to its 275-D line of four-point suspension presses this huge new unit, which is designed to operate with an automatic roll feed and a heavy duty uncoiler. Supplementary rolls level and straighten material before it reaches the dies. This arrangement is capable of feeding 180 inches of 72-inch material at each stroke of the press.

Feed arrangement and press operation are synchronized through an interlocking system which insures the correct amount of material will be fed.

The press, which has a bed area measuring 94 x 208 inches, is equipped with an electrically controlled, hydraulically operated clutch. Power is applied to all four corners of the slide through connections operating simultaneously from two crankshafts. Perfect



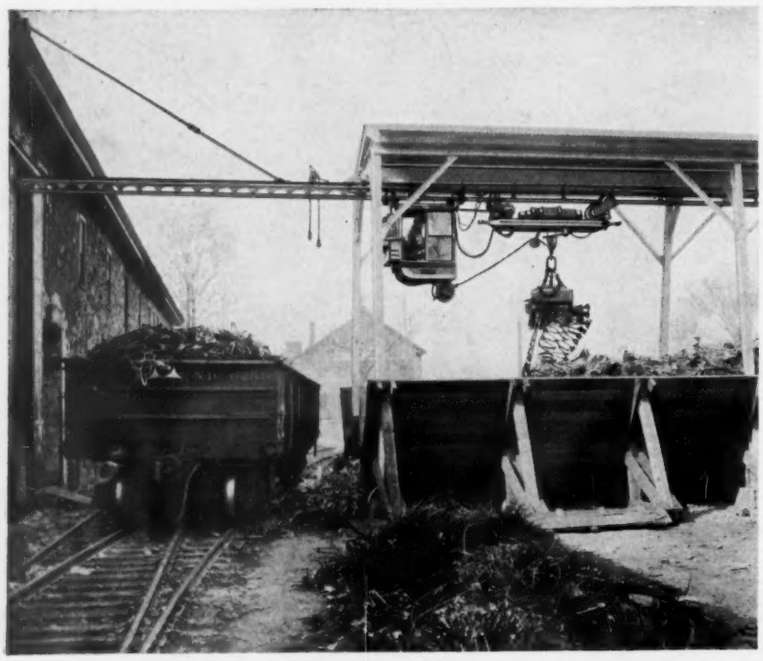
alignment thus is maintained between slide and bed, whether work is in the center or off center.

This type of press and automatic feed can be furnished in sizes to suit particular requirements.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

In the Metal Working Industry



● Jib cranes are efficient equipment for extending Cleveland Tramrail over railroad tracks or for servicing cars and loading docks.

● Moving of scrap from the shop floor to storage bins or car is done inexpensively with a cab controlled carrier and electro magnet.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

New Conveyor Drive

(*Concluded from Page* 48)

mum effective tension with a minimum total belt tension."

This feature gives the drive its name, "floating drive." It also eliminates the necessity for the conventional take-up used in conjunction with head and tail and construction. Therefore no waste space is encountered at either end of a conveyor of this type, thus permitting close connection with production equipment, machines, work tables, fixtures or other conveyors. Where packages transfer at right angles from one belt to another, the terminal structure is compact.

The drive makes use of only a few working parts—just a single drive pulley directly connected to a gearhead type motor or to individual speed reducer coupled to motor. Two idler pulleys are employed, one to secure maximum belt wrap around the driven pulley, and the other to act as a means of securing automatically the correct amount of take-up and belt tension under all atmospheric changes.

Belt Tension Reduced

Tests made of installations indicate that the average belt tension is 30 to 40 per cent less than with conventional drive arrangements. In other words, the conveyor belt tends to remain at minimum tension regardless of load handled. When using the head end, take up type of construction, the take-ups employed are usually adjusted to apply the required tension for operation of drive pulleys and belt at no load. Addition of a load on the belt then increases belt tension to higher values than may be necessary. The floating drive described here avoids these excessive peaks due to the automatic belt tension action of the drive.

Belt conveyors using this floating drive can be made level, inclined, or declined, or in combinations of all three. They are practical in belt widths from 6 to 30 inches, maximum belt pull up to 500 pounds, and up to 3 horsepower. They are reversible in their travel and may be made into portable units as well as a series of stationary floor type units which go to make up a complete conveying system.

Steel Castings Report By British Institute

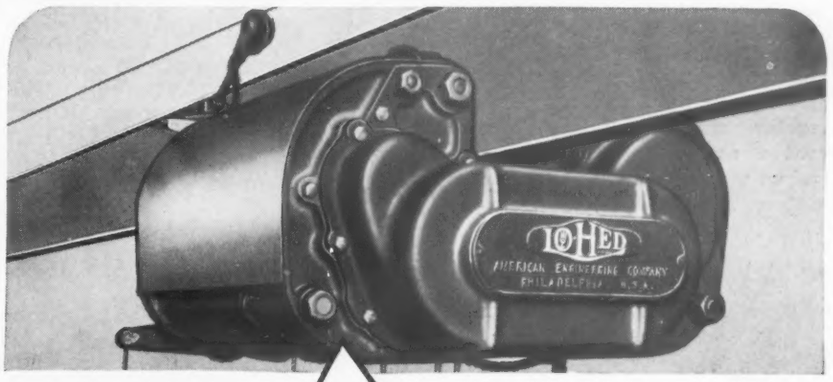
■ *Third Report of the Steel Castings Research Committee,* special report No. 23 of the Iron and Steel institute (British); cloth, 294 pages, 5¼ x 8¼ inches; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W. 1.

The report is by a joint committee of the Iron and Steel institute, British Iron and Steel federation and Iron and Steel Industrial Research council. It was presented at the autumn meeting of the Iron and Steel institute at London in October.

It contains a section on the fluidity of iron-carbon and other iron alloys, with consideration of the Ruff fluidity test. The paper on fluidity is by J. H. Andrew, T. C. Bottomley and W. R. Maddocks. Copper-steel castings are treated by Martin Alexander. Strength and ductility of cast steel during cooling from the liquid state in sand molds is studied in a paper by H. F. Hall.

The first report of the molding materials subcommittee is included. This deals with tests for molding sands, elutriation methods, grading of sands, compression strength of molding materials, refractoriness of molding materials, synthetic molding sands, molding compositions and new sources of molding materials.

A bibliography on manufacture, properties and testing of steel castings is included.



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Assures Safer Handling Here

Specify *THE* hoist with the highest factor of safety!

Let the nearest A-E-CO representative* show you why A-E-CO Lo-Hed HOISTS are the safest hoists built.

Ask him to explain Lo-Hed's exclusive features that mean constant, dependable performance and lower maintenance cost.

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Find out *why* Lo-Hed is the logical hoist for EVERY purpose and why it is the *only* hoist for low headroom conditions. A-E-CO Lo-Hed HOISTS are built in many standard models, from ¼ to 12 ton capacities.

*Classified phone directories list the local A-E-CO representative in principal cities. Call him in... or write us for the new hoist catalog.

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AECO LoHed HOIST

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Dredge Pump Liners Are Flame Hardened for Wear

■ DREDGES employed in clearing river beds, lake channels and dock areas utilize large centrifugal pumps to handle the mud, silt, gravel and other debris. Due to the terrific abrasion, liners on these pumps must be replaced as often as every two weeks when a dredge is working steadily.

The pump casting usually has a recess into which the liner fits. When liner becomes worn, it is replaced by removing the side casting of the pump. This involves about four hours' work and the new liner costs approximately $300 including machining and handling operations.

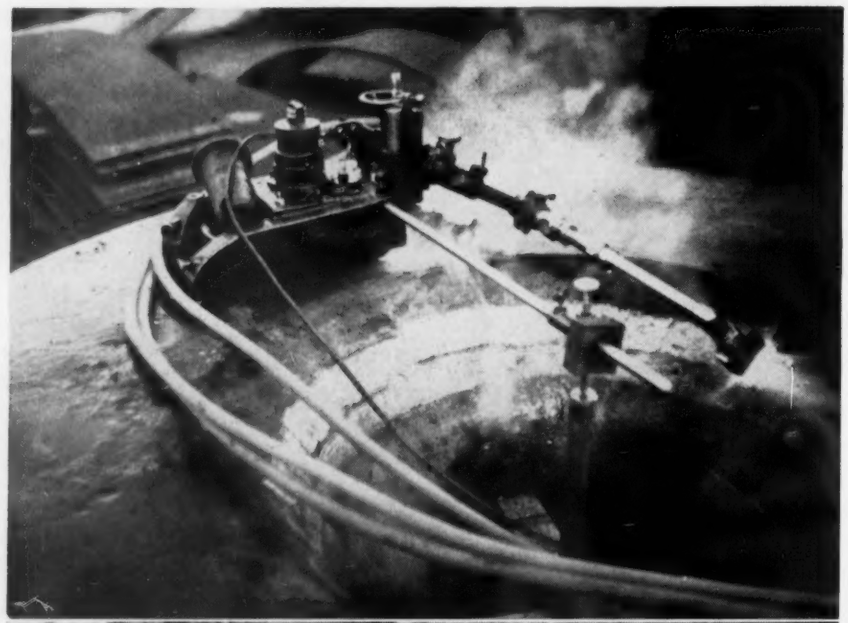
Recently a dredging company, seeking to reduce these costs, tried to obtain a wear-resisting steel that could be machined after casting but so far without success. Various hard-facing applications were tried but were found to warp the casting so it could not be used. Also the cost of hard-facing the large area was too high to be profitable.

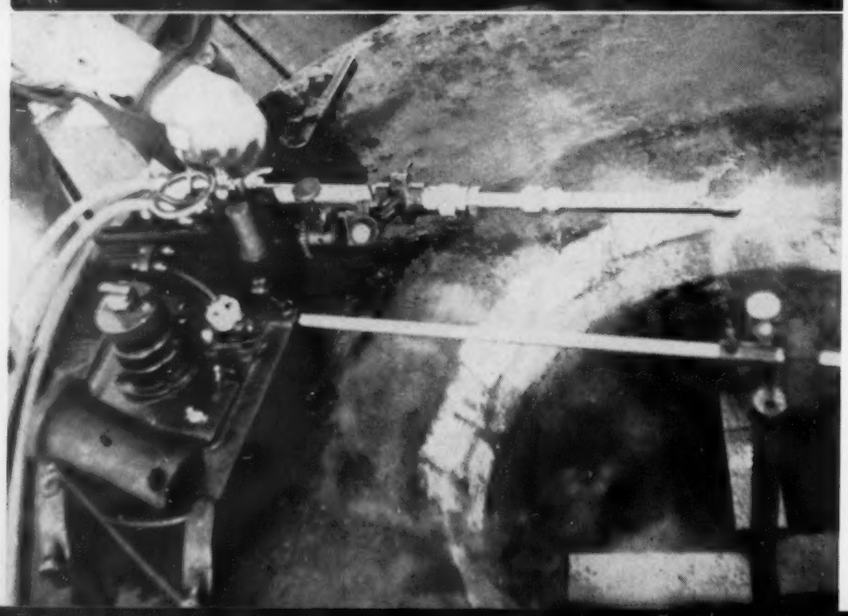
After preliminary tests indicated the method would be satisfactory, the company installed flame-hardening equipment which now handles this work very successfully. The liners are made from a special cast steel containing about 0.45 per cent carbon. Liner is 1¼ inches thick, and has a cone-shaped neck approximately 30 inches in diameter at the large end.

A total of 2400 square inches of surface is flame-hardened to a depth of ⅛-inch using 800 cubic feet each of oxygen and acetylene. A 2-inch multi-flame tip is used mounted on a radiagraph which is guided by a radius rod. Center point of radius rod is set in the end of a round steel bar centered in the cone and braced to hold its position. Average speed of torch travel is 6 inches per minute.

In operation, the torch is driven in a circular path by the motor in the radiagraph, the radial position of the torch being adjusted by hand. Flame hardening of these pieces does not warp the casting.

Top, flame-hardening equipment in operation on neck of liner. Below, operator manually adjusts torch position as motor driven carriage revolves around center pin. Photos courtesy Air Reduction Sales Co., New York





Studies Cleaning and Film Building Agents

■ From a recent study, J. N. Ostrofsky, chief chemist, Rustless Iron & Steel Corp., Baltimore, concluded there is no better agent for cleaning stainless steels than 20 to 40 per cent warm nitric acid, but it was determined that there are other agents which appear more effective than strong nitric acid for bolstering oxide film on a clean surface.

It was found that weak nitric acid, containing only 0.1 to 1.0 per cent acid by weight, used boiling, will develop film demonstrably superior and more impenetrable in passivity-activity borderline corrosion conditions than those produced by strong acid. When used on clean surfaces, boiling alkali dichromates, in about 5 per cent solutions, are excellent passivating agents, particularly against pitting or where drop staining occurs. It was found, however, that these strong film builders were not particularly effective as cleaners.

Map Shows Location of Country's Lime Plants

■ *Map of Lime Plants of the United States;* available in three sizes, 22 x 17 inches, 44 x 34 inches and 66 x 48 inches; paper, cloth back, wall board back, or roll type; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from $1.00 to $2.50 for small size, $2.50 to $7.50 for intermediate size, and $12.50 to $26.00 for large size.

This map is based on data from directories of the industry and supplemented with information from governmental departments, railroads and the companies themselves. All cities, towns and villages having lime plants are designated to show the extent of the industry at a glance. Below the map is a list of the firms or companies operating in each place. The locations given are the plants, not necessarily the offices or warehouses.

ADVERTISING PAGES REMOVED

A.S.M.E. Sessions Report Research

(*Concluded from Page* 46)

fully understood, the speaker presented results of his study of some of these phenomena, correlating them with the facts already known about the first yielding of this material.

To investigate the rate of loading on yielding of mild steel a machine was designed in which the amount of increase in load per unit time could be held constant regardless of rate of strain. Results of tests were presented in which the rate of loading for separate tests was changed by minimum ratio of 1 to 21,000. The effect of rate of loading was studied on four different shapes of test specimens.

Factors affecting the initial yielding of mild steel and their influence on the shape of the stress-strain diagram were discussed. These factors included the effect of the speed of deformation and of speed concentration upon the stress at which yielding takes place.

The manner in which localized yielding affects the stress distribution in the test bar and changes the actual strain rate was also described. The constant-load rate type of test such as presented was compared with the ordinary test of this type. Various shapes of stress-strain diagrams which had been obtained by practice were explained in terms of the foregoing factors.

Forces required for rolling strip under tension were discussed by A. Nadai, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He pointed out that while sheets are being reduced under lateral pressure of the rolls, tensile stresses are set up. He spoke of an investigation of the influence of front and back tension on the roll pressures and described a theory developed for the rolling action, which also considers tension.

Influences of roll diameters and what happens when the rolls flatten were among questions proposed in the subsequent discussion for later study.

Report on Cutting Fluids

Results of experiments to determine influence of each of several classes of cutting fluids on tool life when turning S. A. E. 3140 steel with different sizes of cut were described in a paper by O. W. Boston, W. Gilbert and L. V. Colwell, University of Michigan, Ann Arbor, Mich. Experiments were in three series. In the first, two cuts were used having the same area, with depth in one case equal to eight times the feed and in the other, to twice the feed. In the second series, feed was kept constant while depth was varied over a considerable range to give cuts of different area. All cutting fluids were tested for each combination of depth and feed. In the third series, depth was kept constant while feed was varied to give a series of cuts of different area.

The authors correlated all data to show the influence of each type of cutting fluid as a function of the size and shape of cut, as a function of the cutting speed for a given tool life and in terms of the volume of metal removed per tool grind.

Cites Hydraulic Development

Discussing modern hydraulic units for machine tools, K. R. Herman, Vickers Inc., Detroit, said that the field of hydraulics had undergone special development in the past 15 years. Units have been developed which are compact, reliable and suitable for application to individual machines. Their compactness, he said, has also made them less costly for use with central pressure systems.

Honing machines, Mr. Herman stated, are now operating hydraulicly at as high as 1200 strokes per minute, fluid motors as high as 8000 revolutions per minute and turbines at 50,000 to 75,000 revolutions. Hydraulic units are especially to be desired wherever tremendous mechanical reduction is required, he said.

Additional advantages, he pointed out, are relative simplicity and the flexibility of insulation where fluid conduits make the connection between the elements of a machine and where mechanical connection of the parts would be much more complicated.

Mr. Herman discussed development of a vane-type pump, which he said, has proved satisfactory in fulfilling many of the needs of machinery manufacturers. He also described a variable-volume pump for large hydraulic transmission of the variable-speed type.

Application of hydraulics to machine tools also was discussed by Paul S. Jackson, Rockford Machine Tool Co., Rockford, Ill., who expressed the opinion that the general trend of machine tool design for years to come will follow the use and application of hydraulic units not only in shaping, planing and slotting, but also in drilling, honing, broaching, milling, turning, grinding and practically all the metal removing processes.

Two outstanding accomplishments of the year resulting from the work of the society's research committee were reported by the council, namely, completion of a voluminous report, "Assembly and Interpretation of Available Creep-Test Data," and completion of editing of the report on metal cutting data, which when published is to be called a "Manual on the Cutting of Metals."

Six completed standards were presented to the American Standards association for approval, these involving face-to-face dimensions of ferrous flanged and welding end valves, terminology and definitions for single-cutting tools, time series charts, twist drills, steel pipe flanges and flange fittings (revision) and cast iron pipe flanges and flange fittings (revision).

Among achievements of the Safety committee during the year were completion of the safety code for compressed air equipment and machinery, and "a long step toward" completion of a safety code for cranes, derricks and hoists.

Featuring work of the boiler code committee is adoption of allowable working stresses for ferrous and nonferrous materials. In addition, rules for fusion welding have been extended to apply to tube and pipe connections which are not in contact with furnace gases. A study is being made to provide rules for the use of stainless steel and clad materials.

Forum on Re-employment

(*Concluded from Page* 37)

be wiped out. And this end can be achieved without loss to labor of any of the gains to which our workmen rightfully are entitled.

Over 50 years ago the late John H. Patterson of Dayton, O., placed this slogan above the doorway of one of his factory buildings where it can still be seen: "Improved machines make men dear, their products cheap." As a people, we should take that truth to heart. Machines create more jobs by widening markets. It has been estimated that one of our medium-priced automobiles, if made largely by hand methods, would cost $17,000 — a price prohibitive to all but a few people. With the aid of up-to-date machinery, the price of a good, dependable car actually has been brought down to about $700. The demand at that price has brought into existance an array of industries employing over 6,000,000 people, and still growing.

In this writer's opinion, solution to the whole unemployment problem depends upon the earnestness with which we cast aside the artificial obstacles that lie in the way of putting to work all our available machines. With the co-operation of investors, management, labor and the government, we *can* produce and distribute more goods, and that unquestionably will spell recovery and re-employment.

On All Types of O. D. Grinding

The Norton "B-E" Wheel Is Breaking Records

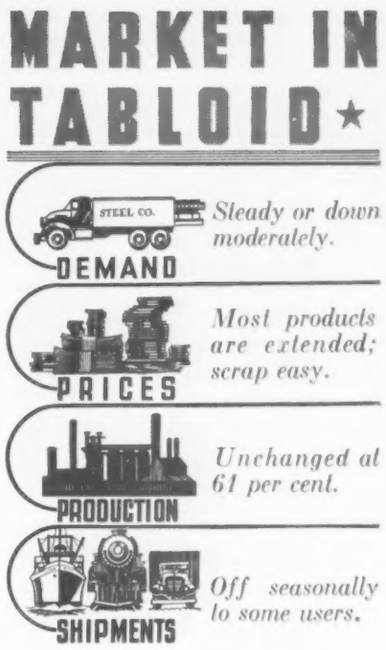
FAST "spark out"—that's the result you can expect from the Norton "B-E" bonded O. D. grinding wheels. Try these fast cutting wheels on your centerless and cylindrical grinding operations. The patented "B-E" bond is an exclusive Norton development.

NORTON COMPANY, WORCESTER, MASS.

W-679

Effect of Season On Output Slight

Steelmaking Resists Slower Trend In New Business



■ STEEL production is offering strong resistance to the quieting influence of the approaching year-end.

New business is slower, the result of the season as well as the forward commitments made in some products a number of weeks ago. Nevertheless, the additional letdown in operations prior to the usual holiday slump is expected to be relatively moderate.

Schedules in most districts were unchanged last week, the national rate of steel output holding at 61 per cent. This compares with 27 per cent a year ago.

Renewed buying of finished steel confidently is expected with the turn of the year. In contrast to the situation 12 months ago, consumers will enter 1939 with relatively moderate stocks of most products. Sheet and strip inventories, while heavy in some instances, will be lighter than was anticipated at the time buyers were actively covering forward needs.

Automobile builders, operating at the best rate in 16 months, have placed some small fill-in lots of flat-rolled steel at full market prices. With sustained assemblies scheduled into January, sheet and strip quotations will be given a more severe test next month, when larger automotive orders are expected.

Rush To Start PWA Work Quickens Building Steel

In addition to the favorable outlook for the automobile industry, several other sources of steel business give promise of lending considerable support to production next quarter. The recent spurt in structural and reinforcing bar inquiries and awards will be intensified the remainder of December by the PWA program. Numerous projects under that bureau must be under contract or bid by Jan. 1, and the last-minute rush for estimates will flood the market the next three weeks.

Annual track material buying by railroads is starting to appear, and purchases during ensuing months are likely to be well ahead of totals a year ago. Norfolk & Western has placed 13,000 tons. Union Pacific's 1939 requirements of rails and fastenings are estimated at 80,000 to 100,000 tons. This past year no new rails were bought by the latter.

Recent improvement in railroad earnings enhance equipment buying prospects, but further substantial gains will be necessary to finance comprehensive programs of freight car and locomotive purchasing.

Automobile assemblies last week rose several thousand units to 100,705 cars and trucks, highest since August, 1937. The increase resulted largely from further expansion in Ford's operations. With retail buying sustained and stocks materially smaller than a year ago, the seasonal tapering in production early next quarter is expected to be gradual.

Tin Plate Output Expands; Further Gain In Prospect

Tin plate output is heading upward, following an extended period of light schedules, and all signs point to further gains after Jan. 1. Small carryover of tin plate into next year will be an important factor in bolstering production.

Steel ingot production expanded more than seasonally in November. Gain over October was 14.6 per cent, largest for the month in history. Total production was 3,572,220 tons, against 3,117,934 tons in October and 2,154,365 tons in November, 1937.

Steel prices generally are steady, except for easiness in traditionally weak products. Several producers have announced reaffirmation of pig iron prices for next quarter. With a few exceptions, all iron and steel quotations now are established for the coming period.

Steelmaking last week dropped 4 points to 43 per cent at Pittsburgh and 5.5 points to 66.5 per cent at Cleveland, but this was offset by gains of 3 points to 59.5 per cent at Chicago, 4 points to 80 per cent in New England and 2 points to 86 per cent at Detroit. Other districts were unchanged, including eastern Pennsylvania at 37, Wheeling at 62, Buffalo at 49, Birmingham and Cincinnati at 75, St. Louis at 51.5 and Youngstown at 65.

Except in areas influenced by export business, scrap markets are easy and the scrap composite is down 9 cents to $14.66. The finished steel composite is unchanged at $56.50 and the iron and steel composite holds at $36.36.

COMPOSITE MARKET AVERAGES

	Dec. 10	Dec. 3	Nov. 26	One Month Ago Nov., 1938	Three Months Ago Sept., 1938	One Year Ago Dec., 1937	Five Years Ago Dec., 1933
Iron and Steel	$36.36	$36.36	$36.37	$36.39	$36.48	$38.88	$31.01
Finished Steel	56.50	56.50	56.50	56.68	57.20	61.70	51.10
Steelworks Scrap..	14.66	14.75	14.79	14.58	14.23	13.24	10.12

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Dec. 10, 1938	Nov. 1938	Sept. 1938	Dec. 1937
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.75
Iron bars, Terre Haute, Ind	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.55
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.65
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.10	$5.35	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	$34.00	$34.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	Dec. 10, 1938	Nov. 1938	Sept. 1938	Dec. 1937
Bessemer, del. Pittsburgh	$22.34	$22.34	$21.34	$25.26
Basic, Valley	20.50	20.50	19.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	21.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	21.21	25.21
No. 2 foundry, Chicago	21.00	21.00	20.00	24.00
Southern No. 2, Birmingham	17.38	17.38	16.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	19.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.125	22.215	26.215
Malleable, Valley	21.00	21.00	20.00	24.00
Malleable, Chicago	21.00	21.00	20.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.24
Gray forge, del. Pittsburgh	21.17	21.17	20.17	24.17
Ferromanganese, del. Pittsburgh	97.77	97.77	97.77	107.49

Scrap

Heavy melting steel, Pittsburgh	$15.50	$15.15	$15.25	$13.40
Heavy melt. steel, No. 2, E. Pa.	13.00	12.75	12.75	13.13
Heavy melting steel, Chicago	13.75	14.20	13.60	12.40
Rails for rolling, Chicago	17.75	17.40	17.75	14.25
Railroad steel specialties, Chicago	16.00	16.10	16.60	15.75

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.30
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New Cork, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c
Iron	
Terre Haute, Ind.	2.15c
Chicago	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c
Reinforcing	
New billet, straight lengths, quoted by distributors	
Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports, f.o.b. car docks	2.50c
Philadelphia, del.	2.22c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45
(Per pound)	
Polished staples	3.15c
Galv. fence staples	3.40c
Barbed wire, galv.	3.20c
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00
To Manufacturing Trade	
Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c
Worcester, Mass., $2 higher on bright basic and spring wire.	
Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

* Delivered.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.80c
Detroit, delivered	2.90c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.			1.10
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring flats			0.15
6100 bars			1.20
6100 spring flats			0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares			0.40

Electric furnace up 50 cents.

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23/16-in.

Pittsburgh, Chicago, Gary, Cleveland Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass., $4 higher.

Commodity Cold-Rolled	Strip
Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chgo., B'ham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-12½ off; bulk 85 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off
Plow bolts	65-5-5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½ inch & less	65-5	70
9/16-1-inch	60-10	65
1⅛ and larger	60-5	60-5

Hexagon Cap Screws

Milled	50-10-5 off
Upset, 1-in., smaller	65-10 off

Square Head Set Screws

Upset, 1-in., smaller	73-10 off
Headless set screws	62-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Blk.	Galv.
Steel		
½	63½	54
¾	66½	58
1—3	68½	60½
Iron		
¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel		
2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54
Iron		
2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel		
1 to 3, butt weld	67½	
2, lap weld	60	
2½ to 3, lap weld	63	
3½ to 6, lap weld	65	
7 and 8, lap weld	64	
10-inch lap weld	63½	
12-inch, lap weld	62½	
Iron	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Clev., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 9/32-inch incl.	43.00
Do., over 9/32 to 11/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$27.75

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.75	23.25	22.25	23.75
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.87	.....	.....	.....
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.25
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birmingham	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.44	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malle-able	Basic	Besse-mer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del. Chicago	28.34
		Lyles, Tenn.	23.50

Silvery†

Jackson count, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%. $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $92.50
Do., del. Pittsburgh 97.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., New Orleans 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 97.75
2% carbon 102.75
1%, 112.75
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, freight allowed lb. 4.75c
Ton lots 5.25c
Less-ton lots 5.50c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.76
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.40
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.50
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.68	3.83	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.01	4.16	4.16	3.96	3.96	5.71	3.91	....	5.26
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	4.20	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	4.20	....	5.50
Portland, Oreg.	4.30	4.70	6.10	4.15	4.15	5.90	3.75	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	4.00	4.00	5.60	4.00	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.36	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.95	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	4.10	3.83	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.64	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	4.18	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.09	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.60	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Dec. 8

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$25.74 5 10 0	$17.04	2 0 0
Basic bessemer	....	16.40	1 18 6
Hematite, Phos. .03-.05	30.42 6 10 0*	.....	.....
Billets	$36.86 7 17 6	$42.60	5 0 0
Wire rods, No. 5 gage	52.77 11 5 6	43.66	5 2 6
Standard rails	$47.39 10 2 6	$48.99	5 15 0
Merchant bars	2.30c 11 0 0	2.00c to 2.05c	5 2 6 to 5 5 0
Structural shapes	2.22c 10 12 6	1.90c	4 17 6
Plates, †¼ in. or 5 mm.	2.42c 11 11 3	2.19c to 2.39c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.72c 13 0 0	2.83c	7 5 0*
Sheets, gal., 24 ga., corr.	3.29c 15 15 0	3.41c	8 15 0
Bands and strips	2.77c 13 5 0	2.05c	5 5 0
Plain wire, base	4.08c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
Galvanized wire, base	4.86c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
Wire nails, base	3.87c 18 10 0	2.73c to 2.93c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.74 1 0 3	.....	.....

British ferromanganese $92.50 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs	Belgian Francs	Reich Mark
Fdy. pig iron, Si. 2.5	$25.51 5 9 0(a)	$15.73 598	$16.85 500	$25.26 63
Basic bess. pig iron	23.40 5 0 0(a)	....	....	27.86 (b)69.50
Furnace coke	6.44 1 7 6	5.92 225	7.25 215	7.62 19
Billets	36.86 7 17 6	22.09 840	28.98 860	38.69 96.50
Standard rails	2.12c 10 2 6	1.38c 1,150	2.06c 1,375	2.38c 132
Merchant bars	2.56c 12 4 0††	1.30c 1,080	1.65c 1,100	1.98c 110
Structural shapes	2.30c 11 0 6††	1.27c 1,055	1.65c 1,100	1.93c 107
Plates, †¼-in. or 5 mm	2.45c 11 14 3††	1.62c 1,350	2.06c 1,375	2.29c 127
Sheets, black	3.29c 15 15 0§	1.92c 1,600‡	2.36c 1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.87c 18 10 0	2.70c 2,250	4.13c 2,750	6.66c 370
Plain wire	4.08c 19 10 0	1.98c 1,650	2.48c 1,650	3.11c 173
Bands and strips	2.71c 12 19 0††	1.45c 1,210	1.95c 1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75.25 per cent over paper sterling.

—The Market Week—

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	†12.00
Bos. dock No. 1 exp.	13.50-13.75
New Eng. del. No. 1	14.00
Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	13.50-14.00
Chicago, auto, no alloy	12.00-12.50
Chicago, No. 2 auto	11.00-11.50
Cincinnati, dealers	12.00-12.50
Cleveland, No. 1	13.50-14.00
Cleveland, No. 2	12.50-13.00
Detroit, No. 1	10.00-10.50
Detroit (industrial)	10.50-11.00
Eastern Pa., No. 1	15.00
Eastern Pa., No. 2	13.00
Federal, Ill.	12.50-13.00
Granite City, R. R.	13.00-13.50
Granite City, No. 2	12.00-12.50
Los Angeles, No. 1	13.50-14.00
Los Angeles, No. 2	12.50-13.00
N. Y. dock No. 1 exp.	11.50-12.00
Pitts., No. 1 (R.R.)	16.00-16.50
Pittsburgh, No. 1	15.50-16.00
Pittsburgh, No. 2	14.50-15.00
St. Louis, R. R.	13.00-13.50
St. Louis, No. 2	12.00-12.50
San Francisco, No. 1	12.00
Seattle, No. 1	12.00-13.00
Toronto, dlrs. No. 1	10.00-11.00
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	12.50-13.00
Chicago, dealer	11.50-12.00
Cincinnati, del.	11.50-12.00
Cleveland	13.00-13.50
Detroit	11.75-12.25
E. Pa., new mat.	15.00
E. Pa., old mat.	10.50-11.00
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	11.00-11.50
Valleys	14.00-14.50

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.50-15.00
St. Louis	8.00- 8.50
Toronto, dealers	4.00

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati, dealers	7.25- 7.75
Detroit	8.75- 9.25
†Los Angeles	3.75- 4.00
St. Louis	7.50- 8.00

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	12.00-12.50
Cincin., No. 1, deal.	8.25- 8.75
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	10.00-10.50
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	4.00

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	7.00- 7.50
Cincinnati, dealers	5.75- 6.25
Cleveland	7.00- 7.50
Detroit	5.75- 6.25
Eastern Pa.	8.50- 9.00
Los Angeles	4.50- 4.75
New York	†3.50- 4.00
Pittsburgh	10.00-10.50
St. Louis	4.00- 4.50
Toronto, dealers	4.25- 4.75
Valleys	8.50- 9.00

SHOVELING TURNINGS

Buffalo	8.50- 9.00
Cleveland	7.50- 8.00
Chicago	8.50- 9.00
Detroit	6.75- 7.25
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.25- 7.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Eastern Pa.	6.50- 7.00
Detroit	5.75- 6.25
New York	†2.50- 3.00
Pittsburgh	8.25- 8.75
Toronto, dealers	3.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.00-13.50
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00- 9.50
Toronto	5.00

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†6.00- 6.25
Buffalo	8.00- 8.50
Chicago	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.25- 7.75
Detroit	5.75- 6.25
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.00- 3.00
Toronto, dealers	3.50

RAILROAD SPECIALTIES

Chicago	15.75-16.25

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	14.50-15.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	17.00-17.50
Chicago, leaf	16.00-16.50
Eastern Pa.	16.50-17.00
Pittsburgh	16.75-17.25
St. Louis	15.50-16.00

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, dealers	17.25-17.75
Detroit	16.50-17.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	16.75-17.25
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	14.00-14.50
Cleveland	17.00-17.50
Pittsburgh	16.25-16.75
St. Louis	14.00-14.50
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	14.00-14.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	9.50-10.00
Cincinnati, dealers	7.25- 7.75

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	9.00- 9.50
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.50-14.00
New York	†8.50- 9.00
St. Louis	9.50-10.00

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	15.00-15.50
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	13.00-13.50
Toronto, No. 1 dlr.	10.00

FORGE FLASHINGS

Boston district	†8.00- 8.25
Buffalo	12.00-12.50
Cleveland	11.50-12.00
Detroit	9.50-10.00
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	16.50-17.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	16.50-17.00
Pitts., billet, bloom, slab crops	18.50-19.00

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	16.00-16.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.25-17.75
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	18.00-18.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00
Chicago, net	19.00-19.50
Eastern Pa.	21.50-22.50
St. Louis	19.00-19.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†14.75-15.00
New York	†15.50-16.00
Eastern Pa.	19.50-20.00
St. Louis, 1¼-3¾"	17.00-17.50

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	14.00-14.50
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	16.50-17.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	16.75-17.25
St. Louis, iron	14.00-14.50
St. Louis, steel	15.50-16.00

NO. 1 CAST SCRAP

Birmingham	†12.50-13.00
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	10.50-11.00
Chicago, auto net	12.00-12.50
Chicago, railr'd net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	14.00-14.50
Cleveland, mach. net	16.75-17.25
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50-15.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.25-15.75
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	12.50-13.00
St. L., agr. mach.	14.00-14.50
St. L., No. 1 mach.	15.00-15.50
Toronto, No. 1, mach., net	11.00-12.00

HEAVY CAST

Boston dist. break.	†10.75-11.00
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break. net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	9.50-10.00
Eastern Pa.	16.00
Los Ang., auto, net	13.00-13.50
New York, break.	†11.50-12.00
Pittsburgh, break	13.25-13.75

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	7.25- 7.75
Detroit, net	8.50- 9.00
Eastern Pa.	13.50-14.00
New York, fdy.	†10.00-10.50
St. Louis	8.00- 8.50
Toronto dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	15.00-15.50
Cincin., agri. deal.	12.50-13.00
Cleveland, rail	15.00-15.50
Eastern Pa., R. R.	15.50-16.00
Los Angeles	17.50-18.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	12.00-13.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	nom.
Tungsten. sh. ton. unit, duty pd. nom.	$20.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	32.00
So. African, 50-52% nom.	32.00
Indian, 50-52%	Nominal

—The Market Week—

Sheets

Sheet Prices, Page 84

Pittsburgh — New automotive business has appeared in the sheet market, indicating depletion of tonnage acquired a number of weeks ago at depressed prices. Current quotations were adhered to on recent placements, although a better test of prices is looked for next quarter when heavier purchases will be necessary. Buying elsewhere is light, a reflection of the season. Production is fairly steady, being off only slightly from the fall peak, while backlogs will sustain output the remainder of December. Black plate prices and extras have been revised, following recent reductions in tin and terne plate. The new base for black plate, 29 gage and lighter, is 3.05c, Pittsburgh, against 3.15c formerly.

Cleveland — While sheet mills are busy clearing books of old orders, new business is insufficient to maintain this pace for long after Jan. 1. Automotive demand predominates, with new buying from this source anticipated soon. Tin mill black, recently 3.15c, now is quoted 3.05c for black plate, 29 gage and lighter. New extras are to be published shortly.

Chicago — Flat-rolled steel production is the chief support to steelmaking here, with some sheet mills running near capacity. New bookings are light, and while no improvement is thought likely the remainder of this month, renewed buying is looked for in January, when most of the tonnage booked at reduced prices will have been shipped.

Boston — While sheet buying is slackening, shipments against orders are heavy. Since most unfilled tonnage was placed below prices recently reaffirmed for first quarter, consumers are pressing for delivery of this tonnage. Consumption is well sustained, particularly among automotive suppliers.

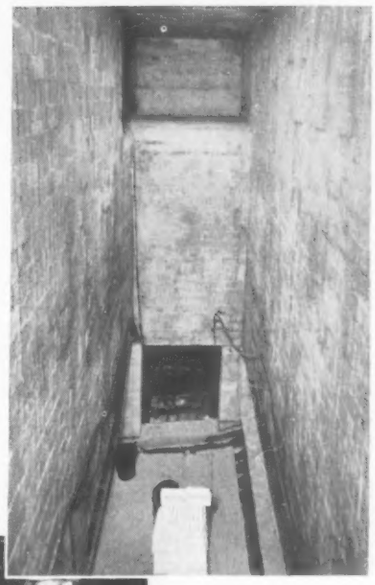
New York — While sheet business has tapered somewhat this month, there are still relatively good specifications for immediate consumption. Producers have enough tonnage to keep them busy for several weeks, in most cases.

Philadelphia — Delivery of some low-price sheets will extend into January, but new business at current quotations has improved surprisingly. This includes some automotive tonnage. An air-conditioning equipment interest is planning 1939 production of 12,000 portable units requiring 2500 tons of sheets. Philco radio makers are reported planning to build household refrigerators, with the purchase of mid-

ARMSTRONG'S

BRICK AND COPRTEX CEMENT

. . . aid in efficient drying of sludge in Chicago Sewage Treatment Plant



INTERIOR VIEWS *of high temperature ducts at Southwest Sewage Treatment Plant, Sanitary District of Chicago, Stickney, Ill. The up-take chambers and ducts are lined with nearly 200,000 Armstrong's EF-26 Insulating Fire Brick and Armstrong's Coprtex Heat Insulating Cement.*

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PLASTIC CEMENTS · DIATOMACEOUS EARTHS

western manufacturing facilities. New Jersey is in the market for 1200 tons of sheets for 1940 license plates.

Buffalo — Consumers are inactive in forward buying, filling needs through releases against previous orders. Extension of prices and approach of the inventory period are factors in restricting new business. Production holds about 60 per cent.

Cincinnati — Few sheet consumers are anticipating future needs, present consideration being the absorption of tonnage now on order. November shipments were the best this year, and mills are assured of nearly equal activity this month.

St. Louis — Sheet commitments have receded further, affected by the season and price reaffirmation. Stove manufacturing has declined, with some shops closing soon for the holiday period. Freight car building is expected to result in some sheet business. Sheet production continues heavy.

Birmingham, Ala. — Considerable demand for sheets continues and no appreciable letup is expected at least into first quarter. Production remains at about 100 per cent.

Plates

Plate Prices, Page 84

Pittsburgh — Central Barge Co., Chicago, has divided an order for 30 barges equally between American Bridge Co. and Bethlehem Steel Co. About 7500 tons of plates and shapes is involved. Central Barge also has ordered a towboat from Marietta Mfg. Co., Point Pleasant, W. Va.

Cleveland — Placing of 6400 tons of fabricated steel car parts for Chesapeake & Ohio and Pere Marquette railroad car repairs features the plate market.

Boston — Plate business is maintained, partly because of increasing releases for ship work and large diameter pipe. About 800 tons of plates will be required for water tanks, most of which have been awarded. Most boiler and structural jobs are taking little material, while jobbers have balanced inventories and have curtailed purchases. Occasional shading is noted.

New York — Plate buying still is featureless, although a list for the Norfolk & Western will be up for action shortly. Shipyard buying primarily is for scattered repairs. Tank and boiler work still lags. Construction, particularly bridges, is spurting contra-seasonally, and this should be reflected shortly in plates.

Philadelphia — Demand is quieter, with lighter plates less active than heavier gages. Shipbuilders are releasing lots of only a few hundred tons. The oil industry of the southwest and west coast is accounting for little tonnage.

Birmingham, Ala. — Freight car building, government projects and scattered orders continue to hold plate production steady. New railroad buying is expected to keep the level up.

Seattle—Bids have been opened at Washington, for 1500 tons of plates, shapes and other items, involved in construction of U. S. S. MONSSEN at Puget Sound navy yard. Tacoma, Wash., will open bids Dec. 15 for furnishing 9580 feet of 58-inch coal tar steel pipe, alternate lock joint concrete, $200,000 available. Plates involved total 900 tons but fabricators state they cannot compete with concrete under the specifications. Award of 1000 tons for storage tanks for Richfield Oil Co. has not been announced.

San Francisco — Interest in the plate market centers around opening of bids Dec. 12 on 2450 tons of plates for a welded steel or precast reinforced concrete pipe line for the metropolitan water district, Los Angeles. If precast pipe is purchased over 400 tons of sheets and 1400 tons of reinforcing material will be required. Awards total 4875 tons, bringing the year's aggregate to 45,132 tons, compared with 60,192 tons for the same period a year ago.

Plate Contracts Placed

570 tons, pontoon and shore pipe, Brooklyn, N. Y., to Tippett & Wood, Phillipsburg, N. J.

200 tons, 500,000-gallon elevated tank, Norwood, Mass., to Chicago Bridge & Iron Co., Chicago; bids Nov. 28.

150 tons, 250,000-gallon elevated tank, Narragansett, R. I., to Chicago Bridge & Iron Co., Chicago.

105 tons, caissons, gravel switch, Tennessee valley authority, Knoxville, Tenn., to Chattanooga Boiler & Tank Co., Chattanooga, Tenn.

100 tons, standpipe, Sanbornville, N. H., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

5000 tons, large diameter steel pipe, water system, Wayland, Weston, Southboro and Framingham, Mass; Metropolitan district commission, Boston, project.

1500 tons, including shapes, for U. S. S. MONSSEN building at Puget Sound navy yard; bids in at Washington.

900 tons, 58-inch, alternate lock joint concrete, for Tacoma, Wash.; bids Dec. 15.

250 tons, 600,000-gallon elevated tank, Brunswick, Me.; bids Dec. 6.

200 tons, 500,000-gallon elevated tank, Norwood, Mass.; bids in.

150 tons, 250,000-gallon elevated tank, Lawrence, Mass.; bids Dec. 10.

Strip

Strip Prices, Page 85

Pittsburgh — Small fill-in orders have been received from automotive interests, but heavy buying is expected to be deferred until after Jan. 1. Business from other consumers continues light, but production is fairly well sustained by old orders. Output is moderately below 55 per cent.

Boston — New business has declined below the volume of shipments and rate of consumption. While little tonnage is going into stock, some low-carbon material bought at lower prices is being added to inventories. Releases against such orders are heavy, and some rerollers are operating as high as 70 per cent.

New York—Consumers are pressing for shipment of low-carbon tonnage booked at low prices and new buying has declined. Business in high-carbon stock remains relatively active, although demand is for immediate needs only. Consumption is holding, aided by good operations among purveyors to the automotive industry.

Bars

Bar Prices, Page 84

Pittsburgh — Producers have announced extension of current base prices on cold-finished carbon steel bars and shafting, as well as cold-finished alloy bars, for shipment through first quarter.

Cleveland — Bar demand is principally from automotive suppliers. Production is fairly heavy, with deliveries ranging up to ten days. Cold-finished carbon and alloy bar prices have been reaffirmed for first quarter, following the extension of hot-rolled quotations.

Chicago — Bar business retains recent gains. Sales are expected to be maintained for another week before the usual year-end lull appears.

Boston — Commercial steel bar business is spotty. Warehouses are taking smaller lots, but needs of government shops, including shipyards, are encouraging. Forging material is more active in some instances, but railroads are buying practically nothing. Bar prices are steady.

New York — Bar tonnage is fairly steady but down from a month ago. Sellers expect business to taper the remainder of the year as a result of the season. Automotive accessory manufacturers are the larg-

est buyers of both plain carbon and alloy grades and cold drawn bars.

Philadelphia — Considerable ship tonnage is pending for both navy and maritime commission work. A small amount of miscellaneous business is appearing from machine tool, forging and small tool interests. The latter are operating about 60 per cent.

Buffalo — Further expansion in automotive orders has pushed bar mill operations to the best rate since October a year ago. Production is around 60 per cent, but one interest is running full. Fair business also is being received from other bar consumers.

Birmingham, Ala. — Bar production remains at 60 per cent and sustained orders are expected. Agricultural implement manufacturers' orders remain the bright spot.

Pipe

Pipe Prices, Page 85

Pittsburgh — Decline in demand for tubular products is most pronounced in oil country goods. In many cases, drillers have fulfilled requirements of oil leases and will cease activity until the end of the year. Business in larger pipe lines is at a standstill. Standard pipe demand is steady. Pressure tubing is slow, but mechanical tubing still is moving in fair volume as a result of active automotive demand.

Cleveland — Jobbers' pipe shipments show little change, though some decrease is expected for December. Cast pipe demand remains fairly active, with Cleveland in the market for 275 tons.

Boston — Cast pipe buying continues active, about 2500 tons having been booked lately. This includes orders for Narragansett, R. I., and Acton and Hamilton, Mass. Purchases by the procurement division for New England now are centered at Boston, except for Connecticut, where New Haven is the buying point. Merchant steel pipe for building construction is moving better.

New York — Cast pipe buying is slightly heavier with more work coming out for estimates as the year ends, including 9000 tons for New York city, expected up for bids this week. Pumping station and sewage disposal needs are heavier while a contractor has placed 1200 tons for a water system, prison, Green Haven, N. Y.

Eastern sellers of steel pipe have extended prices for first quarter, although the resale situation here continues unsettled. Buying is spotty, with substantial tonnages still held up on certain housing work. At the same time considerably more new construction is being figured than a year ago.

Birmingham, Ala. — No particular increase is expected in pipe production here but orders have remained fairly steady and output is on a four-day-a-week basis.

Seattle—Larger tonnages of cast iron pipe are coming up for figures and placements will likely be considerable within the next 30 days. Tacoma has called bids Dec. 19 for 27,000 feet of 4 to 20-inch cast iron pipe and fittings, $192,000 available, 500 tons or more. French pipe is again in competition, that material through Pacific Water Works Supply Co., Seattle, being low at $11,272 for 225 tons of 4 to 8-inch for Seattle. For American pipe, Hugh G. Purcell, Seattle, for United States Pipe & Foundry Co., is low at $11,693.

Bremerton, Wash., has bids in for 160 tons of 6 to 12-inch cast iron pipe. The project at La Grande, Oreg., involving 200 tons, went to steel pipe. Lexington, Oreg., will receive bids Dec. 16, $24,000 available. R. J. Sommers Construction

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CLEVELAND, OHIO

Co., Juneau, is low at $23,000 for a system improvement at Haines, Alaska. Clatskanie, Oreg., has $39,343 available for a reservoir and supply line, bids Dec. 19. Hazelwood district, Portland, Oreg., has called bids Dec. 20 for a $60,000 water system, L. C. Newman, Portland, engineer.

San Francisco — Awards of cast iron pipe were confined to lots of less than 100 tons. So far this year 29,892 tons have been booked, compared with 27,061 tons for the corresponding period in 1937.

Cast Pipe Placed

1200 tons, 12-inch, water system, prison, Green Haven, N. Y., to unstated foundry; Cleverock Construction Co., New York, general contractor.

1200 tons, 12-inch, Hamilton, Mass., to Warren Foundry & Pipe Co., Everett, Mass., through John MacDonald Construction Co., Newton, Mass., contractor; bids Nov. 28.

550 tons, 10-inch and under, Lincoln, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

170 tons, 10-inch, Stratford, N. H., to Warren Foundry & Pipe Corp., Everett, Mass.

150 tons, 24-inch and under, New Rochelle, N. Y., to Warren Foundry & Pipe Corp., Everett, Mass.

Steel Pipe Placed

200 tons, LaGrande, Oreg., water system extension, to unstated supplier.

Unstated tonnage, 200 16-foot lengths, 20-inch i. d., United States engineer, Jacksonville, Fla., to Gaynor Iron Works, Jacksonville; bids Nov. 28, proposal 198.

Cast Pipe Pending

500 tons or more, 4 to 20 in. and fittings, Tacoma, Wash.; $192,000 available; bids Dec. 19.

275 tons, for the city of Cleveland; bids soon.

225 tons, 4 to 8 in. for Seattle; Pacific Water Works Supply Co., Seattle, low for French pipe; H. G. Purcell, Seattle for American material.

160 tons, 6 to 12 in. for Bremerton, Wash.; bids in.

100 tons, 8-inch, procurement division, treasury department, Boston, for Springfield, Mass., delivery.

Wire

Wire Prices, Page 85

Pittsburgh — In the absence of first quarter price changes, quotations on merchant wire products are continuing at recent levels, so far as published figures are concerned. Going prices in various sections are based on individual conditions. Manufacturers' wire, with quotations reaffirmed, are slower, largely because of the season. Production is down but less than expected. Some fill-in automotive orders have been placed.

Chicago — Business in wire and wire products is steady, following recent leveling off in demand. Automotive requirements have changed little, but pressure for delivery is lighter. With consumers' stocks low, the inventory period is expected to have little effect on demand the remainder of the month.

Boston — Wire demand has declined little, consumers still pressing for delivery, to fill immediate needs. Only in isolated cases has production of wire goods declined, operations in most departments averaging 65 to 75 per cent. Indications are for a fair first quarter. Prices on new business are firm.

New York — With wire and rod prices reaffirmed for next quarter, demand is well maintained despite a moderate recession in spring wire by the furniture trade. Chain wire for automotive use and rope for anthracite coal districts are in better demand as a result of weather conditions. Bolt and screw wires retain recent gains.

Birmingham, Ala. — Scattered orders keep wire production at 60 per cent, although demand has not indicated an increase in output during the remainder of the quarter.

Rails, Cars

Track Material Prices, Page 85

Signs of activity are appearing in rails and cars as carriers formulate plans for next year's needs.

Wabash has been authorized by federal court to install automobile loading racks on 200 freight cars and make general repairs on 100 of the cars, total cost $31,480. American Car & Foundry Co. will build 1000 cars recently bought by Illinois Central at its St. Louis shops, assuring a high rate of operations through the first half of next year.

Reading Co. and Central Railroad of New Jersey have placed 15 diesel switching locomotives, five for the Reading Co. and 10 for the Central of New Jersey.

Wheeling & Lake Erie has awarded 400 steel hoppers to Ralston Steel Car Co., Columbus, O. Norfolk & Western has distributed 13,000 tons of 131-pound rails.

Chesapeake & Ohio and Pere Marquette have distributed 6400 tons of steel for car repair work.

Colorado Fuel & Iron Corp., Denver, is low on 3160 gross tons of rails and 1177 tons of accessories for reclamation bureau.

St. Louis & San Francisco is budgeting for about 12,000 tons of 112-pound rails for its 1929 program. Union Pacific plans to place 80,000 to 100,000 tons of rails and accessories for next year.

Domestic freight car awards in November involved 1232 units and brought the total for the first 11 months to 13,752 cars. This compares with 51,336 in the corresponding period of 1937, 41,073 in first 11 month in 1936, and 9258 in the same period in 1935.

The November total of 1232 compares with 2537 in October and 1750 in September. The highest monthly total so far this year was 6014, in May. November bookings included the award of 1000 box cars by the Illinois Central. Further comparisons follow:

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.	109	4,972	6,900	806
March....	680	8,155	632	0
April.....	15	9,772	4,427	350
May.....	6,014	4,732	8,900	2
June.....	1,178	548	5,200	5,151
July.....	0	1,030	7,229	500
Aug.	182	1,475	225	200
Sept.....	1,750	1,216	1,750	875
Oct.....	2,537	1,355	2,210	1,250
Nov.....	1,232	275	1,550	100
11 mos....	13,752	51,336	41,073	9,258
Dec.	.....	275	23,450	10,050
Total..	.....	51,611	64,523	19,308

Cars Placed

Wheeling & Lake Erie, 400 steel hoppers, to Ralston Steel Car Co., Columbus, O.

Locomotives Placed

Reading Co. and Central Railroad of New Jersey, fifteen 600-horsepower diesel switching locomotives; nine to Electro-Motive Corp., Lagrange, Ill., four to American Locomotive Co., New York, one each to Baldwin Locomotive Works, Philadelphia, and Fairbanks, Morse & Co., Chicago.

Rails Placed

Norfolk & Western, 13,000 tons 131-pound; 9750 tons to Carnegie-Illinois Steel Corp., 3250 tons to Bethlehem Steel Co.

Tin Plate

Tin Plate Prices, Page 84

Better inquiries point to heavier production of tin plate during coming weeks. The rate for the industry lately has increased to about 40 per cent, compared with its recent low of 30. Orders being received for January shipment are fairly heavy.

Low stocks of tin plate and a small carryover of canned goods are expected to push production to a relatively high level during most of next year. Meanwhile, consumers are interested in holding down inventories.

Manufacturing terne plate consumers, along with tin plate buyers, are sharing in a refund of 25 cents a base box on business placed between Jan. 1 and Nov. 10, 1938.

Tin mill black plate, recently quot-

ed 3.15c, Pittsburgh or Chicago, now is termed black plate, 29 gage and lighter, with base price of 3.05c. New extras also are to be introduced. Formerly, no sizes actually took the 3.15c base price, because of extras. Under new differentials, some sizes will take the new base and in such cases the price reduction is $4 a ton. In most instances the reduction is a $2 revision in extras.

Shapes

Structural Shape Prices, Page 84

New York—Although the design is still incomplete, bids are in on the superstructure, Criminal courts building, New York, the largest pending project in the east. Quotations were taken Dec. 9 on a per ton basis, unofficial estimates placing the volume at 16,500 tons. A sharp increase in active public work inquiry has developed with additional momentum assured during the remainder of the year. Since PWA projects must be bid or under contract before Jan. 1, the sharpest increase in inquiries in months is expected during the next two weeks.

Pittsburgh — Shape activity is sustained, with a large number of new projects involving fabricated material now active. Most of this work should be placed by early January. Inquiries are largely for public works.

Cleveland — Structural requirements remain fairly active, with the outlook even brighter particularly from public sources. Private work is still restricted with little improvement anticipated in the near future. Fabricated prices remain spotty.

Chicago — Inquiries for larger lots are more numerous, while miscellaneous demand is maintained. A federal building at New Orleans will take 2500 tons. Leading award is 1000 tons for a local hospital. Award for the Chicago subway is expected shortly, following announcement of low bidder on the first 3200-foot section. Work is to start this week.

Philadelphia — Considerable tonnage is pending, including several bridges and schools. Fabricators are encouraged by appearance of more private work, including some electrical utilities. Fabricated prices are still weak.

Boston — A heavy volume of work is coming up. Outstanding is two bridge superstructures, 14,000 tons, on which bids will be taken shortly. In addition to more small projects, some of the larger jobs under the federal spending program are nearing the estimate stage. Work around Providence, R. I., takes close to 5000 tons. For bridges, mostly small to replace floor damage in Massachusetts, close to 15,000 tons or 80 per cent of requirements has been awarded.

Buffalo — Pending tonnage is swelled considerably by numerous small jobs, many of which require less than 100 tons. However, a sufficient number of moderate size projects should sustain activity at a fairly good level.

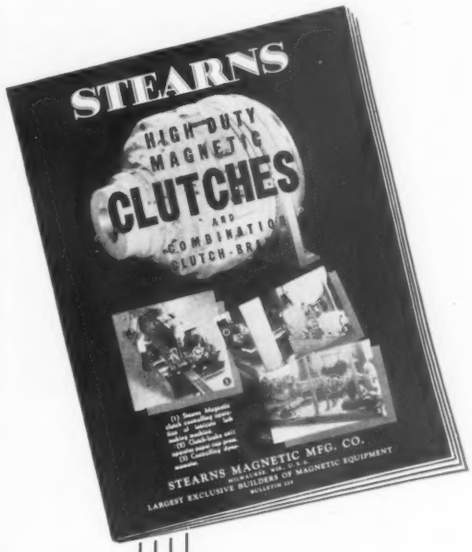
St. Louis — Number of small

Shape Awards Compared

	Tons
Week ended Dec. 10	17,175
Week ended Dec. 3	*49,388
Week ended Nov. 26	18,666
This week, 1937	10,987
Weekly average, year, 1937	23,251
Weekly average, 1938	20,765
Weekly average, November	23,137
Total to date, 1937	1,179,223
Total to date, 1938	*1,017,484

*Revised.

Includes awards of 100 tons or more.



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Behind the Scenes with STEEL

Forum

■ On page 36 this week STEEL dives headlong into an editorial job that promises to bring you the best thinking in the industry on a subject that has stalled business recovery for nine years. Unemployment and the inability to take on willing workers are the most important unsolved phases of industry's many headaches. STEEL has recognized this and discussed it editorially for some time. Now, in a regular weekly Forum on Re-employment executives themselves will self-examine industry's position and offer possible solutions. Read what Mr. Whipp has to say this week. Others will follow. Your comments, too, will be appreciated.

The Real McCoy

■ The height of something or other in union farces was reached a few days ago in a New York jail. Held as a fugitive from a Florida murder charge, George Colmore McCoy (the last of the *real* McCoys) served notice on the magistrate that he was a member of C.I.O. and expected to be paid union wages of 70 cents an hour for all the time he is locked up. You're absolutely right, Mac, and we've lined up all the boys out here in the Ohio Pen to "walk-out" if they don't pay you off. Dey can't git away wid dat!

Ask Us Another

■ It's strange the things people think we know, but it's even more amazing that we know so much. Into the Readers Service Department every week comes a conglomeration of questions that would make old Solomon break out in a cold sweat, but someone here always seems to know the answer. Who makes a copper pot cleaner like the sample we sent you? What kind of steel would you recommend for gaffs used by fighting cocks? Will you trace the history of cold rolling of steel? To whom can I sell my fluorspar deposit? To what extent is granulated slag being used for insulating houses? Who makes this, who makes that, and can you give me a complete list of this, that or the other thing? Nine times out of ten we can, and we do it gladly as a service to regular readers. Once in a while we may have to charge a few bits on something special but not often. Nicest thank-you note last week came from J. Harris Tyre of Philadelphia in return for material requested on steel houses: "You have gone to considerably more trouble and taken more time and pains that I had any right to expect. This will be most helpful and prove a valuable source of information". Service with a capital S! Try it yourself.

Who Next?

■ It seems everyone wants to lay claim to Eddie Dowling's "isms" story as their own. Last week it was a Peoria dentist and now it comes out in *The Financial Times* of London, attributed to the *Wall Street Journal*. It's about time now for Jack Benny or Fred Allen to give it the error.

Gypsy Rose Lee, Met.

■ There have been some technical questions on the Roxy Burlesque continuous strip mill mentioned here last week. We answered them pretty well until one of our anonymous hecklers asked *Who can take the shimmy out of the wabblers?* so we took that midnight inspection trip they have on Saturday nights to see what he meant. We sat right up by the run-out table and used an optical pyrometer on the strip as she buckled going through her rolls but we came away convinced it would be silly to try to correct that shimmy. That, dear heckler, is absolutely fundamental.

—SHRDLU

jobs have been placed or are pending, but only project up for competition locally is a highway bridge, Miami county, Missouri, requiring 1600 tons. Fabricators are drawing on reserves and are not expected to purchase much through December.

San Francisco — While less than 100 tons were reported placed, close to 53,000 tons are either up for figures or pending. Bids will be opened on Dec. 14 for 1000 tons of sheet steel piling for a quay wall at the navy yard, Mare Island. This year, 156,074 tons have been placed, compared with 140,554 in 1937.

Seattle — Port of Portland has set Dec. 16 for bids for steel towers and equipment for its 15,000 ton dry dock, a $367,000 project, involving 1250 tons of shapes. For gate guides and drum anchorages at Coulee dam, Koppers Co., Baltimore, reported low, about 500 tons involved.

Shape Contracts Placed

1700 tons, state bridge over Green river, Rockport, Ky., to Bethlehem Steel Co., Bethlehem, Pa.

1400 tons, high school, Kenmore, N. Y., to Bethlehem Steel Co., Buffalo.

1200 tons, field house, Virginia, Minn., for city, to Wisconsin Bridge & Iron Co., Milwaukee.

1000 tons, psychiatric hospital, Chicago, to Duffin Iron Works.

850 tons, bridge, Ludlow, Mass., to American Bridge Co., Pittsburgh; Coleman Bros. Corp., Boston, general contractor.

820 tons, Washington Heights apartment, New York, to Dreier Iron Works Inc., New York.

600 tons, bridge and approaches, Anderson county, Tennessee, to Bethlehem Steel Co., Bethlehem, Pa.; MacDouglad Construction Co., Atlanta, Ga., general contractor.

600 tons, auditorium, Topeka, Kans., to Kansas City Structural Steel Co.

580 tons, 15-story apartment, 25-29 West Fifty-fourth street, New York, to Ingalls Iron Works, Birmingham, Ala.

570 tons, bridges 2 and 4, Curry Hollar road, and bridges 1 and 2, Buttermilk Hollow road, Pennsylvania, to American Bridge Co., Pittsburgh.

530 tons, addition, hangar 3, North Beach airport, New York, to American Bridge Co., Pittsburgh; bids Dec. 2, procurement division, treasury department, New York.

500 tons, veterans' home, Rocky Hill, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; A. E. Stephens Co., Springfield, Mass., general contractor.

500 tons, railroad bridge, Highland Park, Mich., for Wayne county, Michigan, to Wisconsin Bridge & Iron Co., Milwaukee.

500 tons, bridges, Indian Orchard, Barre and Palmer, Mass., to American Bridge Co., Pittsburgh; Coleman Bros. Corp., Boston, general contractor.

490 tons, grandstands, Bethlehem, Pa., school district, to Bethlehem Steel Co., Bethlehem, Pa.

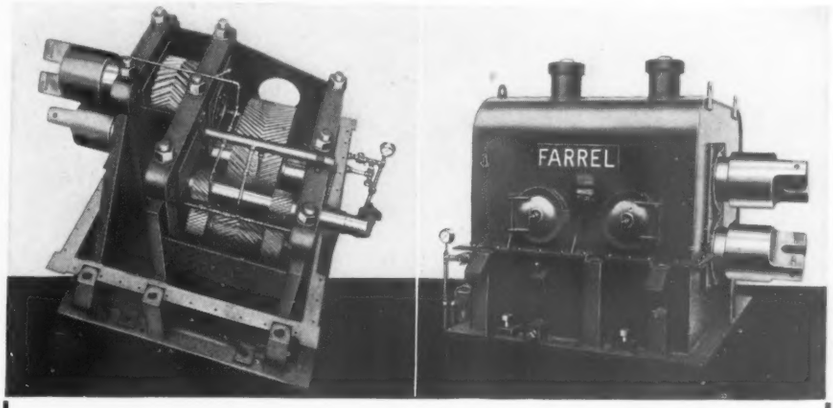
425 tons, elementary school, East Camden, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.; reported Dec. 5 as unstated tonnage.

400 tons, airplane hangar, Great Falls, Mont., to Minneapolis-Moline Power Implement Co.

365 tons, gymnasium, Hamilton college, Clinton, N. Y., to Buffalo Structural Steel Co., Buffalo.
310 tons, three buildings, Grand Rivers, Ky., Tennessee valley authority, Knoxville, spec. 151069, to International Steel Co., Evansville, Ind.
300 tons, factory building, Lummus Co. for unknown owner, East St. Louis, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.
289 tons, United States engineer, Memphis, Tenn., to Jones & Laughlin Steel Corp., Pittsburgh; bids Nov. 22.
280 tons, warehouse, Continental Steel Co., Kokomo, Ind., to Indiana Bridge Co. Inc., Muncie, Ind.
270 tons, 232-foot truss span bridge, Farmington river, superstructure only, Barkhamsted, Conn., to Pittsburgh-Des Moines Steel Co., Pittsbrgh; bids Dec. 5, Hartford.
265 tons, landing platform, North Beach airport, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa., through procurement division, treasury department, New York.
200 tons, two dormitories, University of Tennessee, Knoxville, to Bristol Steel & Iron Co., Bristol, Va.
200 tons, highway bridge 1351-F, Autauga Ala., to Virginia Bridge Co., Roanoke, Va.
165 tons, highway bridge, SP-24-1020, Wathall county, Mississippi, to Jones & Laughlin Steel Corp., Pittsburgh.
160 tons, building 131, Rath Packing Co., Waterloo, Iowa, to Des Moines Steel Co., Des Moines, Iowa.
155 tons, bridge, Bradley, Mich., to Joseph T. Ryerson & Son Inc., Chicago.
150 tons, state highway bridge, Hildreth, Fla., to Bethlehem Steel Co., Bethlehem, Pa.
135 tons, Bonny Eagle covered bridge, Standish Hollis, Me., to American Bridge Co., Pittsburgh, contract 2, steel superstructure; bids Nov. 23, state highway commission, Max L. Wilder, bridge engineer.
130 tons, county home, Bellefonte, Pa., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
135 tons, infirmary building, Middletown, Conn., to Topper & Griggs, Hartford.
125 tons, school, Lynn, Mass., to West End Iron Works, Cambridge, Mass.; E. C. Blanchard Co., Lynn, general contractor.
125 tons, state bridge 5739, Watson, Minn., to Illinois Steel Bridge Co., Jacksonville, Ill.
125 tons, Rugg bridge, Sandersfield, Mass., to Phoenix Bridge Co., Phoenixville, Pa.
120 tons, school, Louisville, Ky., to Louisville Bridge & Iron Co., Louisville.
114 tons, extension to trestle, Cleveland municipal power plant, to Kilroy Structural Steel Co., Cleveland.
102 tons, bridge, Blue river, Green Mountain dam, Colorado, to Mississippi Valley Structural Steel Co., Melrose Park, Ill., 77 tons; and bridge, diversion canal, Columbia Basin project, Washington, to Midwest Steel & Iron Works Co., Denver; bureau of reclamation projects; bids Nov. 23 and Nov. 21 respectively.
100 tons, three bridges, Ooltewah, Tenn., Tennessee valley authority, Knoxville, to Carolina Steel & Iron Co., Greensboro, N. C.
100 tons, school, Trenton, N. J., to Ornamental Iron Works, Trenton; bids Dec. 7.
100 tons, religious center, World's Fair, New York, to Belmont Iron Works, Philadelphia.
Unstated tonnage, procurement division, treasury department, Nashville, Tenn., to Johnson City Foundry & Machine Co., Johnson City, Tenn., $14,495; bids Nov. 18, pro. 609.

Shape Contracts Pending

20,000 tons, criminal court building and jail, New York, Bethlehem Steel Co., low.
7000 tons, truss span bridge with 200-foot vertical lift, double deck, Portsmouth, N. H.-Kittery, Me.; bids soon.
7000 tons, bridge superstructure, Narragansett Bay, Jamestown, R. I., revised estimate; bids about Dec. 15.
5000 tons, plate girder bridge, Housatonic river, Milford-Stratford, Conn.; bids Dec. 15.
4089 tons, Lake Washington pontoon bridge, Seattle; some unit bids in, other call for new bids at Olympia, Dec. 20.
3500 tons, gun assembly shop building 197, Washington, for United States government.
3200-foot section of Chicago subway; Herlihy Mid-Continent Co., Chicago, low with bid of $2,746,104.
2500 tons, federal building, New Orleans.
2500 tons, courthouse, Mineola, N. Y.; bids Dec. 20.
2500 tons, municipal pier, Providence, R. I.; bids about Feb. 1, preliminary contracts placed.
2000 tons, 1600-foot viaduct, elevated highway, Providence, R. I.; bids soon.
2000 tons, building, Marine hospital, Staten Island, N. Y.; bids Dec. 27.
1800 tons, Oceanic bridge, for Monmouth county, Red Bank, N. J.
1800 tons, state office building, Frankfort, Ky.



WELDING SOLVES PROBLEMS *of* DELIVERY *and* DESIGN

A short delivery was required on six of these drives and no patterns available for the case. The difficulty was overcome by welding the cases of rolled plate, with steel castings for the bearing chocks and caps and foundation bolt columns.

Welding also permitted location of light and heavy sections as required without the limitations that an abrupt change of section imposes on cast structures.

The two views of the drive above illustrate the relatively simple design of the interior for mounting the gears and bearings and the rounded contours possible in a fabricated structure.

Other features of these Drives are the integral pinion unit for direct connection to the mill, the Farrel - Sykes continuous tooth herringbone gears and mill pinions and anti-friction roller bearings. The gears are lubricated by built-in sprays and the bearings are flood lubricated, oil being supplied to both gears and bearings by a central lubricating system. The breathers mounted on the cover prevent oil contamination by trapping dirt and moisture.

Farrel Drives are designed and built "to fit the job." Since we are equipped to make both cast and welded structures, a recommendation of either, or a combination of both, is made in the interest of the customer and is not prejudiced by manufacturing limitations.

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1700 tons, trade school, board of education, Springfield, Mass.
1600 tons, highway bridge, Miami county, Missouri; bids Dec. 15.
1575 tons, Oceanic bridge, Rumson, N. J.; Fred T. Ley & Co., New York, low.
1500 tons, state hospital buildings, Middletown, Conn.
1500 tons, apartment building, Cleveland.
1250 tons, grandstand, racing park, Lenox Racing association, Lenox, Mass.
1250 tons, towers, Port of Portland drydock, Portland; bids Dec. 16.
1000 tons, police and fire headquarters, Providence, R. I.; bids in.
1000 tons, underpass, Cottage Farm bridge, Boston, plate girder spans; bids soon.
1000 tons, bearing piles, lake shore drive improvement project, Cleveland; bids Dec. 12, also includes 150 tons of sheet piling, bids will be asked later on 1000 tons of concrete bars.
1000 tons, domestic relations court, New York; bids of Dec. 9 postponed.
1000 tons, sheet piling, quay wall, navy yard, Mare Island, Calif.; bids Dec. 14.
1000 tons, four bridge, state of Wisconsin, scattered locations; bids Dec. 20.
900 tons, family court building, New York.
750 tons, high school, Gloucester, Mass.; bids Dec. 28.
700 tons, apartment, Park avenue and Thirty-fifth street, New York.
700 tons, bridge, Brazoia, Tex.
600 tons, bridge, Elmira, N. Y.; bids Dec. 19.
545 tons, flood wall, Newport, Ark.; List & Clark, Kansas City, Mo., general contractors.
510 tons, Wisconsin avenue bridge, Oshkosh, Wis.; Worden-Allen Co., Milwaukee, low bidder.
500 tons, bottling plant addition, Pfeiffer Brewing Co., Detroit.
500 tons, school, Elmira, N. Y., for board of education.
500 tons, guides and anchorages, Coulee dam, previously reported unstated; Koppers Co., Baltimore low on entire project.
450 tons, nine I-beam bridges, Morristown, Chester, Warren, Vershire, Woodstock and Shaftsbury, Vt.; bids Dec. 15, 21 and 23, Montpelier, H. E. Sargent, commissioner of highways.
400 tons, technical high school, Auburn, N. Y., William E. Bouley, Auburn, low.
400 tons, dispensary, New York; Silverblatt & Lasker, New York, low.
400 tons, high school, board of education, Harrison-Rye, N. Y.
400 tons, factory building, Detroit, for Hinde & Dauch Paper Co., Sandusky, O.
340 tons, addition, public school 142, Brooklyn, N. Y.; Caristo Construction Co., New York, low.
300 tons, apartment buildings, Syracuse housing authority, Syracuse, N. Y.
250 tons, Central school, board of education, South Kortright, N. Y.
250 tons, powerhouse, Alliance, Nebr.
250 tons, commercial high school, Auburn, N. Y., Ross Engineering Co., Washington, low.
250 tons, high school building, Zion, Ill.
245 tons, highway project, Warren county, New York; bids Dec. 20.
230 tons, highway project RC-4010 Delaware county, New York; bids Dec. 20.
220 tons, state bridge, Thames river, Norwich, Conn.; bids Dec. 19, at Hartford.
210 tons, Central school, board of education, Fayette, N. Y.
200 tons, bridge, city of Norwich, Conn.; bids Dec. 12.
200 tons, high school, Garfield Heights, O.; Paugh & Brown, Cleveland, general contractors.
185 tons, two-span I-beam bridge, Lawrence, Mass.; Central Construction Co., Lawrence, low.
180 tons, Mahoning dam, Dayton, Pa., for United States government.
175 tons, addition to manufacturing building, General Motors Corp., Detroit.
175 tons, chapel extension, United States government, Annapolis, Md.
170 tons, bridge, Ashburner street, Philadelphia; bids to state highway department, Harrisburg, Pa., Dec. 16.
155 tons, theater and store building, Brentwood Village Corp., Washington.
150 tons, 212-foot three span I-beam bridge, Huntington-Richmond, Vt.; bids Dec. 16, H. E. Sargent, commissioner of highways, Montpelier.
150 tons, state bridge, Euclid avenue, Paintsville, Ky.
150 tons, buildings, naval training station, United States treasury department, Great Lakes, Ill.
150 tons, junior high school, board of education, Braddock, Pa.
150 tons, bridge, Akron, O.; bids Dec. 14.
125 tons, grade separation, Elizabethtown, Ky., for state.
125 tons, warehouse, Reno Grocery Co., Reno, Nev.
115 tons, beam span, Lordsburg, N. Mex., for United States government.
115 tons, high school, board of education, Homestead, Pa.
110 tons, highway project RC-4011 Dutchess county, New York; bids Dec. 20.
Unstated Montana state bridges, Yellowstone county, at Wolf Point and Harlowton; general contracts awarded.
Unstated tonnage, hotel, corner of Boardwalk and Providence street, Atlantic City, N. J.; bids Dec. 13.

Reinforcing

Reinforcing Bar Prices, Page 85

New York — Reinforcing steel prices are slightly stronger. New inquiry is light with pending requirements featured by 2800 tons for bridge ramps at Brooklyn. A sharp increase in inquiry is assured for estimates between Dec. 15 and 30 as PWA work under the current program must be advertised or under contract by Jan. 1.

Pittsburgh — Awards have improved, but practically all are public jobs. Many are appearing now due to the stipulation that Federal Aid jobs must be under way before Jan. 1, 1939 to obtain action on PWA grants. Price situation is unchanged

Concrete Bars Compared

	Tons
Week ended Dec. 10	7,385
Week ended Dec. 3	8,547
Week ended Nov. 26	10,371
This week, 1937	2,032
Weekly average, year, 1937	6,061
Weekly average, 1938	7,248
Weekly average, November	7,556
Total to date, 1937	304,897
Total to date, 1938	333,399

Includes awards of 100 tons or more.

with weak spots still remaining, although fewer than previously.

Cleveland—Little variation in demand for reinforcing bars has been noted lately. Outstanding work is originating from public sources with private work noticeably absent. Bids are expected soon for 1000 tons for the improvement to the lake front drive, Cleveland. Fabricated prices remain weak.

Chicago—Concrete bars show the best activity for this period in a number of years, aided by favorable weather and the rush to start work on various PWA projects. The first 3500 tons of an ultimate 40,000 tons required for the Chicago subway will be placed shortly. Awards are largest in several weeks.

Boston — Awards are still confined mostly to small lots with volume well sustained. Prices continue soft. Inquiry is heavier and should continue to improve with considerable public construction scheduled for early estimates.

Philadelphia—Some public work is held up due to lack of funds, including a large sewer project in this city. Several attractive tonnages are scheduled for bids shortly, with 1000 tons for Cape May county, New Jersey, bridges outstanding.

San Francisco — Bolstered by several large awards, bookings totaled 2822 tons. This brought the year's aggregate to 145,911 tons, compared with 91,807 in 1937. Soule Steel Co. secured 485 tons for awards for the Lagunda Honda home, San Francisco. Bids open Dec. 14 for 2000 tons for a quay wall for the Mare Island navy yard.

Seattle — Considerable tonnage should be placed within 60 days. Pending work includes more than 13,000 tons for the Lake Washington pontoon toll span, new bids for several units called at Olympia Dec. 20.

Reinforcing Steel Awards

975 tons, Thomas circle underpass, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart Co., New York, contractor.

750 tons, federal jail, Danbury, Conn., to Truscon Steel Co., Youngstown, O.; Edmund J. Rappole Co., Cambridge, Mass., general contractor.

700 tons, board of education, south side vocation school, Chicago, to Calumet Steel Co., Chicago.

485 tons, wards for Lagunda Honda home, San Francisco, to Soule Steel Co., San Francisco.

450 tons, Naples pier, San Diego, Calif., to unnamed interest.

410 tons, storehouse, navy yard, Portsmouth, N. H., to Bethlehem Steel Co.; Aberthaw Construction Co., Boston, general contractor.

400 tons, dormitory building, Purdue university, West Lafayette, Ind., to Hugh J. Baker Co., Indianapolis.

370 tons, administration building and barracks, Aberdeen, Md., to Truscon Steel Co., Youngstown, O.; Ralph Herzog, contractor.

307 tons, bureau of reclamation, invitations 24,666-A and A-8777-A, Blaisdell, Ariz., to Columbia Steel Co., San Francisco.

300 tons, high service reservoir, Reading, Pa., to Truscon Steel Co., Youngstown, O.; C. W. Good, contractor.

275 tons, barracks, Camp Dix, New Jersey, to Bethlehem Steel Co., Bethlehem, Pa.

263 tons, bureau of reclamation, invitation A,38,184-A, Odair, Wash., to Youngstown Sheet & Tube Co., Youngstown, O.

226 tons, research center, department of agriculture, Beltsville, Md., to Rosslyn Steel & Cement Co.

224 tons, storm sewer, to Worden-Allen Co., Milwaukee; through Illinois state procurement office.

213 tons, bureau of reclamation, invitation A-8755-A, Engle, N. Mex., to Republic Steel Corp., Cleveland.

180 tons, dormitory building, Indiana university, Bloomington, Ind., to Truscon Steel Co., Chicago.

150 tons, schoolhouse, Covington, Ky., to Truscon Steel Co., Youngstown, O.; through J. & F. Warm Co., general contractor.

137 tons, bureau of reclamation, invitation B-42,155-A, Calexico, Calif., to Columbia Steel Co., San Francisco.

125 tons, school, Milbrae, Calif., to Gilmore Steel & Supply Co., San Francisco.

123 tons, transmitting station, Mare Island, Calif., to Ceco Steel Products Corp., San Francisco.

112 tons, bureau of reclamation, invitation 24,664-A, Blaisdell, Ariz., to Columbia Steel Co., San Francisco.

110 tons, sewage disposal works, Groton, Conn., to Concrete Steel Co., Boston.

100 tons, state employes building and hospital, Traverse City, Mich., to Calumet Steel Co., Chicago.

Reinforcing Steel Pending

13,431 tons, Lake Washington pontoon bridge, Seattle; bids in on several units; new bids for others at Olympia, Dec. 20.

4500 tons, water aqueduct, Massachusetts, Metropolitan district commission, Boston.

2000 tons, quay wall, Mare Island navy yard, California; bids Dec. 14.

2000 tons, 3200-men barracks, Hickam Field, T. H.; bids Jan. 6.

1700 tons, bars and mesh, bridges and highway projects, New Jersey; bids Dec. 28, Trenton.

1200 tons, bridge, Narragansett Bay, Jamestown, R. I.; bids Dec. 20.

900 tons, mostly mesh, state highway project, New York; bids Dec. 20.

900 tons or more, $1,000,000 barracks building, Fort Lewis, Wash.; bids Dec. 28.

900 tons or more, state building, Washington capitol group; bids at Olympia, Dec. 22.

825 tons, concrete wall, protection project, Kenova, W. Va.; bids Jan. 5, United States engineer, Huntington, W. Va.

800 tons, housing project, Youngstown, O.

600 tons, garage for city of Cincinnati; general contract to Penker Construction Co., Cincinnati.

500 tons, Delaware aqueduct, section 321.

400 tons, McKnight road, Allegheny county, Pennsylvania.

600 tons, Oceanic bridge, Rumson, N. J.;

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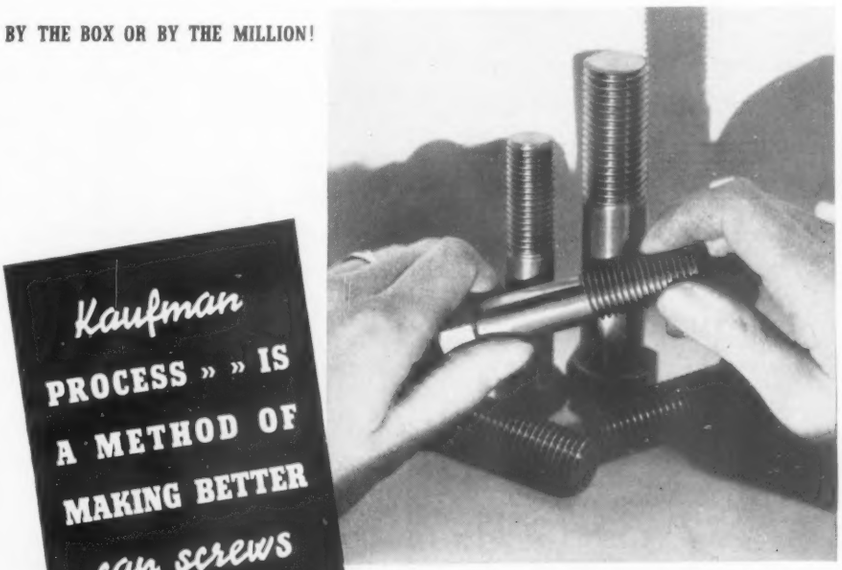

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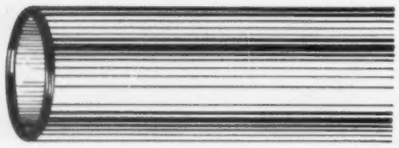

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Fred T. Ley & Co., New York, low.
400 tons, water tank, Sacramento, Calif.; bids Dec. 16.
400 tons, waterworks, Ft. Wayne, Ind.
395 tons, four bridges, state of Wisconsin, scattered locations; bids Dec. 20.
350 tons, state highway bridge, West Fairview borough, Cumberland county, Pennsylvania; bids Dec. 16.
325 tons, grade separation, Sawmill Run boulevard and West Liberty avenue, Pittsburgh.
250 tons, bridge, Housatonic river, Milford-Stratford, Conn.; bids Dec. 15.
250 tons, flood wall, Newport, Ark.; List & Clark, Kansas City, Mo., general contractors.
220 tons, riverfront boulevard, contract 1, Pittsburgh; bids Dec. 15.
200 tons, addition to east approach, to Main street bridge, Cleveland; bids Dec. 30, also includes 100 tons of structurals.
200 tons, junior college buildings, Sacramento, Calif.; bids Dec. 20.
200 tons, sewage plant, Madison, Wis.
175 tons, school, Paterson, N. J.
150 tons, section 19A of Pennsylvania turnpike, Lower Mifflin township, Cumberland county, Pennsylvania; bids Dec. 15.
140 tons, bridge, Ashburner street, Philadelphia; bids to state highway department, Harrisburg, Pa., Dec. 16.
135 tons, drainage structure between Gillette and North Little Rock, Ark.; MacGeorge Construction Co., Pine Bluff, Ark., general contractor.
120 tons, sewage disposal plant, Uniontown, Pa.
100 tons, relocation of Leechburg road, including bridge over Plum creek, Pennsylvania.
100 tons, schoolhouses, Covington, Ky., bids in.
100 tons, three bridges, Passaic county, New Jersey; bids Dec. 14.
Unstated tonnage, barracks, Baltimore; bids Dec. 12.

Pig Iron

Pig Iron Prices, Page 86

Pittsburgh — Pig iron movement is affected by year-end influences, although first quarter inquiries, and in some cases orders, are better. Foundry operations are spotty, some plants being scheduled for little change this month, while others will curtail materially.

Globe Iron Co., Jackson, O., has announced opening of first quarter books at unchanged prices.

Cleveland—Releases are off slightly from November, and December shipments are expected to show the usual seasonal decrease. First quarter outlook is encouraging. Consumer inventories are estimated as relatively low, with producers' stock normal.

Boston — Most pig iron tonnage owed consumers against old purchases will have been delivered before the first of the year, current buying being held to small lots for prompt delivery, as melters are operating with hand-to-mouth inventories. Most contract tonnage for the closing quarter has already been shipped. Foundry melt continues to improve slowly and no buying has been done, pending price announcements for first quarter.

Chicago — Pig iron shipments hold about the level a month ago, when the movement was the best to date this year. While new business is quiet, some pickup in ordering is in early prospect, since consumers generally contracted in September for requirements little, if any, beyond this quarter.

New York—Eastern pig iron sellers are reaffirming prices for first quarter, as expected. Meanwhile, the melt is disappointing, and a dull market is seen the remainder of the month. Export buying continues light. Confirmation is lacking of rumors regarding an inquiry for 120,000 to 150,000 tons. A long-pending Japanese order for 30,000 tons went to an Australian furnace.

Philadelphia—Sellers expected to have considerable unshipped tonnage, taken at $1 under the current market, on books Jan. 1. A little business has been booked at the higher market, however. December shipments are lighter, following the marked upturn last month.

Buffalo — Shipments so far this month are behind the November pace, and foundry operations also have declined moderately. A gain in both is anticipated early next year.

Cincinnati—Deliveries this month are moderately behind the November movement, as melters avoid piling iron with the approach of the inventory period. New business is expected to recover slowly, since considerable iron placed at $1 a ton below the current market will be carried over.

Birmingham, Ala. — Sixteen of the district's 18 blast furnaces remain in operation, but producers are ready to reduce output immediately at the outset of the seasonal decline, which thus far has been delayed.

Toronto, Ont. — Pig iron sales continue to gain, holding above 2000 tons weekly, but no large pickup is expected until next quarter. Some inquiries have been issued for that period, but booking are for spot delivery. Pig iron production is rising slowly, while imports are at a standstill.

Semifinished

Semifinished Prices, Page 85

Pittsburgh — Semifinished steel demand is steady, indicating some stocking by nonintegrated mills and by some small producers having excess of finishing capacity. This tendency in turn points to expecta-

tions of better demand for finished steel after the first of the year. Skelp is quieter, but wire rod orders are holding. Best activity continues in sheet bars, releases being ahead of schedule in some instances.

Scrap

Scrap Prices, Page 88

Pittsburgh—Scrap is softer here, but quotations are unchanged. Some trading in small lots of No. 1 steel is being done at $15, with larger lots bringing up to $16, although scrap is more plentiful than formerly. Lower prices were shown on some railroad lists recently. Part of such tonnage went for export.

Cleveland — Buying of scrap is restricted and dealers find supplies are easier to obtain. Renewed buying is expected late in the month for January delivery. Shipments on orders are being made steadily. Prices tend to be easier, without change in quotations.

Chicago — Prices are lower, No. 1 heavy melting steel being off 50 cents for the week on a mill purchase at $14. Dealer-broker trading is being done at $13.50. With mill stocks ample for the time being, a quiet market is expected until after the holidays.

Boston — With boat loading heavier, dock prices for heavy melting steel for export against old orders are stronger, brokers paying from $13.50 to $13.75 for No. 1 and a dollar less for No. 2. This represents an advance of 50 cents a ton in some instances. Domestic demand is flat, with buying spotty and in small lots. Prices show little change. For delivery in this district some No. 1 machinery cast is moving at unchanged prices with No. 2 cast bringing $11.25. Little tonnage is being shipped to Pennsylvania, prices being paid for numerous steelmaking grades at most consuming points in that district being too low for dealers here.

Philadelphia—Steelmaking scrap is stronger as a result of buying for export at prices ranging up to $15 for No. 1 and $14 for No. 2, f.a.s. Port Richmond. The market also is strengthened by the report a large independent steelmaker may release shipments after a two-month holdup. Mill buying is scant, except for the direct purchase of new automobile compressed sheets at about $13.50, Philadelphia plant.

Detroit — Scrap is inactive, with prices tending toward weakness, except for strength in new heavy auto cast which is up 50 cents to $13 to $13.50. Industrial heavy melting steel, however, is easier. Automotive lists are light, considering the relatively high rate of assemblies.

Buffalo — Scrap demand is sluggish, with prices unchanged but more or less nominal. One mill has held up shipments until Dec. 15. Dealers look for a revival in buying next month.

Cincinnati — Scrap is easier, reflecting light purchases here and weaker markets in other districts. Consumers generally are out of the market until next month. Bids on recent railroad lists were lower than a month ago on a number of items.

St. Louis — Dealers largely have covered recent sales of heavy melting steel, and in the absence of new orders the market is quiet, with some prices lower. Shipments from the country have increased further, while railroads are pushing delivery of scrap bought from them the past few weeks. This has resulted in excess supplies, although little distress material has accumulated.

Birmingham, Ala. — Only scattered orders for scrap are being received, and there is no immediate prospect of improvement.

Seattle—Increasing strength in scrap is attributed to recent buying by Japanese interests, credit releases having been more numerous. No. 1 melting is quoted around $14, f.a.s., and is not plentiful at tidewater. Little No. 2 is being exported but rolling mills are purchasing both grades, as required by operations. Trans-Pacific shipments are fairly heavy but pending permits have been used and no new business from the Orient is expected before next month. Shipments from the interior, although temporarily handicapped by weather conditions, are expected to increase if present demand continues.

Toronto, Ont. — Interest in scrap is mounting, dealers reporting better sales. Machinery cast and heavy melting steel are most active, with wrought scrap and stove plate having few buyers. Prices are firm. Dealers are offering $10 to $11 for heavy melting steel.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

Bolt, nut and rivet demand is moderating, following fairly steady business in November. Inquiries generally are for early January shipment, with seasonal influences expected to restrict activity the remainder of December. Except for one large order for the Philadelphia navy

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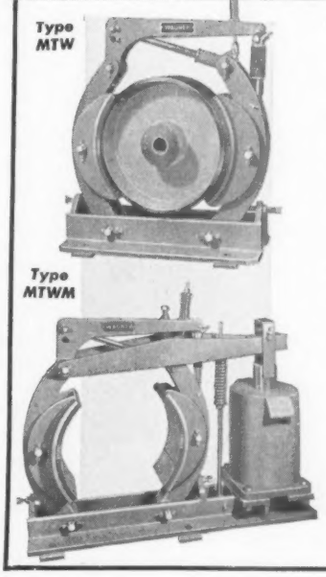

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yard, business in the East is dull. Republic Steel Corp. was successful bidder at $26,992.43 on 440 tons of bolts and nuts for this yard. Next low bidder was Bethlehem Steel Co. at $29,360.88. While bolt and nut prices still are irregular, some signs of strengthening have appeared. One large producer recently advised its customers it was withdrawing all prices on bolts and nuts because quotations were below manufacturing costs. New discounts announced on some products show higher prices. These include hexagon cap screws, square head set screws and semifinished hexagon nuts. Discounts on semifinished hexagon nuts now are named for three sizes instead of four. Rivet prices have been reaffirmed for first quarter.

Warehouse

Warehouse Prices, Page 87

Cleveland—While business shows little change since a month ago, December shipments are expected to be off 10 to 15 per cent from November. Orders are lighter individually but more numerous.

Chicago — Sales are well maintained, seasonal influences thus far having only slight effect on demand. However, the trend is not expected to be upward before January.

Boston — Business has declined in practically all products. Sheet business has been fairly well maintained until recently, indicating jobbers' inventories at the end of the year will not be excessive. Some prices are being shaded in the Boston district.

New York — Volume is slackening gradually. Number of orders holds well, the drop being more evident in tonnage per purchase. The recession appears largely seasonal.

Philadelphia — Sales are tapering slightly but are well diversified. Prices still are irregular.

Buffalo — Sales are close to the November level, but a seasonal letdown the remainder of the month is thought not unlikely. Unchanged prices are looked for next quarter.

Cincinnati — Sales are resisting the seasonal downward trend, with orders for industrial use slightly heavier. Dullness in building materials is increasing.

St. Louis — Warehouse demand is receding seasonally, but this quarter will be the best of the year as well as better than a year ago. Oil country goods continue active.

Seattle—Business is slow and uncertain and jobbers anticipate no improvement until next month. November sales were less than October. Prices are unchanged and generally maintained in this area.

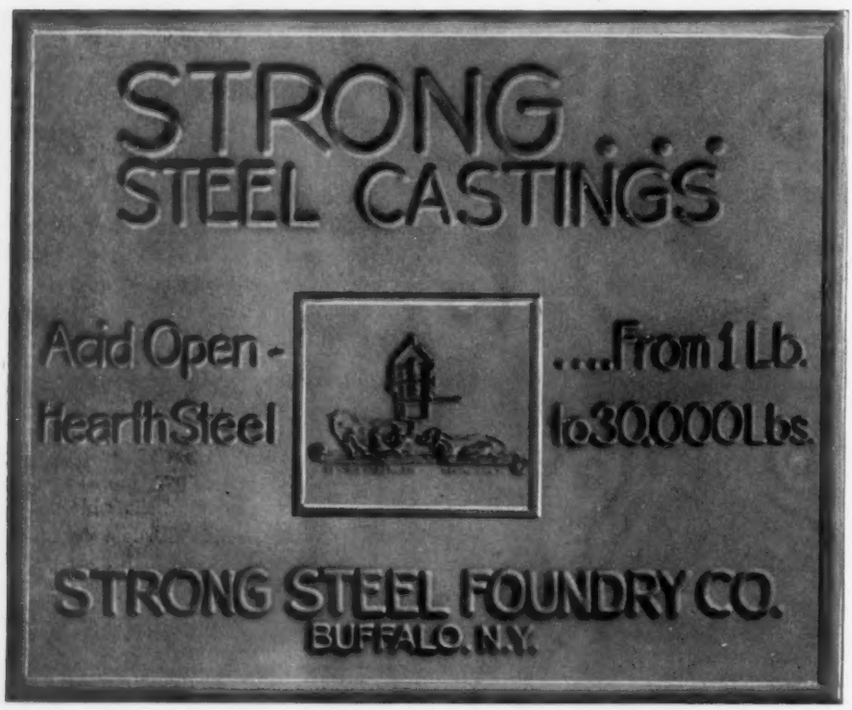
Ferroalloys

Ferroalloy Prices, Page 86

Ferromanganese, spiegeleisen and other leading ferroalloys have been reaffirmed for first quarter. The ferromanganese price is $92.50, duty paid, Atlantic and Gulf ports, and domestic spiegeleisen, $28, Palmerton, Pa., for 19 to 21 per cent material, and $33, for 26 to 28 per cent.

Other ferroalloys affected include ferrochrome, silicon manganese, ferrovanadium and ferrotitanium.

Ferromanganese shipments may show some decline this month as a result of seasonal influences. The November movement was better than that of any preceding month this year.



Steel in Europe

Foreign Steel Prices, Page 87

London — (*By Cable*)—Steel and iron markets of Great Britain are quiet, pending announcement of prices for next year. Reports are that reductions of 5 to 10 shillings per ton are likely to be made and that prices will be fixed for not more than six months. Ferromanganese has been reduced £2 from Jan. 1.

Midland markets are particularly dull, one blast furnace has been banked in Derbyshire and one steelworks closed in South Wales.

The Continent reports dull markets but Germany has been a heavy pig iron buyer. The wire rod comptoir has been renewed until December, 1940.

Senator Has Bills To Provide Railroad Relief

■ Declaring that railroads are $500,000,000 behind in expenditures for maintenance of physical condition, Senator Burton K. Wheeler, chairman of the senate committee on interstate commerce, outlined legislation for government loans before a recent conference of the New England council at Boston.

Bills ready for submission to congress would give railroads power to borrow from the government on terms insuring repayment. They would extend to all railroads the privilege of granting prior liens for new money borrowed for necessary purposes. This is possible now only for roads in receiverships.

Another bill provides standards for financial reorganizations of railroads, with provisions for expediting procedures and "loosening the grip of holding companies."

Coke Oven By-Products

Coke By-Product Prices, Page 85

New York — Prices on distillates, toluol, xylol, solvent naphtha and benzol have been reaffirmed for six months.

Activities of Steel Users, Makers

■ WILLIAM Jessop & Sons Inc. has opened its own steel warehouse and offices at 2706 West Van Buren street, Chicago. The company has also appointed Cold Finished Steel Sales Inc., 1230 Callowhill street, Philadelphia, sole agent and distributor of its tool steels in Pennsylvania, Delaware and southern New Jersey.

♦

E. C. Wollaeger and I. X. Calhoun, Cleveland representatives of Oilgear Co., Milwaukee, have changed the location of the Oilgear district office to 3109 Mayfield road.

♦

Northwestern Steel & Wire Co., Sterling, Ill., has appointed Gunn-Alkon Inc., 207 A street, Boston, as sales agent for its line of hardware cloth in the New England states.

♦

Olsen Engineering Co. contemplates reopening the Moline Plow Co. at Stoughton, Wis. The company will operate as a small production castings jobber and machinery builder.

♦

Flori Pipe Co., St. Louis, has opened a branch sales office in Salem, Ill. Stocks will consist of line pipe, casing, tubing, valves, fittings, wire rope and a complete line of driller's and oil field supplies. F. W. George is in charge.

♦

Whiting Corp., Harvey, Ill., has transferred Detroit offices from the Machinery building, 2842 East Grand boulevard, to 210 Curtis building, 2832 West Grand boulevard. Walter Hans is district manager.

♦

Wisconsin Motor Corp., Milwaukee, maker of internal combustion engines, has received an order from R. A. Lister & Co. Ltd., London, England, for 450 motors, bringing to 1048 the number of engines purchased in recent months.

♦

Lewis-Shepard Sales Corp., Watertown, Mass., is now producing a new telescopic stacker, equipped with a retractable revolving base, which will lift a load of 1500 pounds. The elevator may be moved along the floor with its regular travel wheels to any position.

♦

Thirty large Lee unit heaters have been ordered by New York city from Dravo Corp., Pittsburgh, at a cost of $161,490, to heat the 33,000,000 cubic feet in the seven hangars now building at North Beach airport, near the New York World's fair site.

♦

Noblitt-Sparks Industries, Columbus, Ind., will give its employes as a Christmas gift life insurance policies with a total value of more than $1,000,000, and in addition health and accident policies to eligible employes. At least 95 per cent of the employes will receive policies.

♦

Allen-Bradley Co., Milwaukee, has appointed Industrial Machinery Co., Great Falls, Mont., to handle its line of motor control equipment in Montana and northern Idaho. The company has also appointed Paul R. Urich, 1045 West Twenty-sixth street, Erie, Pa., its representative in the Erie territory.

♦

McKenna Metals Co., 200 Lloyd avenue, Latrobe, Pa., manufacturer of Kennametal tools and blanks for steel and metal cutting, has licensed George H. Alexander Machinery Ltd., 82 Coleshill street, Birmingham, England, to sell Kennametal and fabricate tools from it in Great Britain and possessions, exclusive of Canada.

♦

The new warehouse of Central Steel & Wire Co., Chicago, recently completed, consists of three 100 x 600-foot bays containing 187,000 square feet of floor space. Modern equipment includes six ten-ton cranes with automatic crane scales, 13 dial scales with automatic recording devices, band and power saws, plate burning and flame cutting torches, precision sheet shears, plate shears, coil slitters and roller leveller.

♦

Anchor Hocking Glass Corp., Lancaster, O., has set up a new division to co-operate with manufacturers. The division has its own experimental and research facilities, and is equipped to handle almost any sort of specially designed article for industrial use, such as insulating parts, meter covers, glass tile, bowls or other containers that form integral adjuncts of other equipment.

♦

Combustion Engineering Co. Inc., New York, has opened a branch office at 516 Martin building, Birmingham, Ala., in charge of J. B. Emory as district manager, assisted by W. E. Johnson. Mr. Emory has been associated with the company several years in shop management and sales capacities, while Mr. Johnson has long been identified with sales of the firm's equipment in the Birmingham district.

♦

Amercoat Sales Agency, Huntington Park, Calif., exclusive distributor of Amercoat cold-applied, synthetic organic plastic corrosion-resistant coatings, manufactured by American Concrete & Steel Pipe Co., South Gate, Calif., has appointed Robert E. Lanier & Co., Houston, Tex., exclusive distributor

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

of Amercoat products in Texas, Oklahoma, Arkansas, Louisiana and Mississippi.

♦

Columbia Machine Tool Co., Hamilton, O., has acquired the plant of Long & Allstatter Co. and is placing it in production, including improved machines of Long & Allstatter design, such as punches, shears, presses, press brakes and similar metalworking equipment. Columbia heavy duty shapers also will be built in the same plant.

This illustrates one of our larger perforations—slugs from the holes are about the size of twenty-five cent pieces. The comparison ends there, we are sorry to say, but it gives you some idea of how *large* we go.

Dots the size of our *small* perforations aren't easily seen—and that gives you some idea about that too.

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♦

Nonferrous Metals

New York — Continued light buying of metals, reflecting in part consumers' desire to keep inventories as low as possible, and uncertainties created by strained European political relations weakened the general price structure of metal markets last week. The foreign organization controlling copper production took steps to prevent the market from easing further. The cartel announced that output would be restricted to 105 per cent effective Dec. 15 and to 100 per cent effective Jan. 1.

Copper — Sales in the domestic market remained light at about the November pace which made the total for that month only 12,524 tons, the lowest for any month in recent years. Actual consumption is holding up well, however, and a further reduction in refined stocks is expected to be reported for November. All first hands continued to quote electrolytic at 11.25c, Connecticut, despite the fact that the export market was quoted generally a full cent under that level.

Lead — Prices declined 15 points on Tuesday and 10 points further on Friday, bringing the market down to 4.75c, New York, and 4.60c, East St. Louis, the lowest levels attained since July 5. Weakness was attributed to increased intake, buying reticence and lower market levels in London. Following the last price reduction, St. Joseph Lead Co. announced that it would limit sales to its daily intake.

Zinc — Total slab zinc stocks dropped 3350 tons further in November to 120,778 tons. The improved statistical position failed to stimulate buying, however, in view of the easier tone abroad. Prime western held at 4.50c, East St. Louis.

Tin — Straits spot eased here to around 45.85c on generally eight sales following declines late in the week in London. Invisible supplies continued to rise during October as deliveries of foreign metal exceeded estimated consumption.

Antimony — Due to unusually

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Dec.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
3	11.25	11.37½	10.77½	45.90	46.05	5.00	4.85	4.50	20.00	12.25	35.00
5	11.25	11.37½	10.77½	45.95	46.10	5.00	4.85	4.50	20.00	12.25	35.00
6	11.25	11.37½	10.77½	46.25	46.40	4.85	4.70	4.50	20.00	11.75	35.00
7	11.25	11.37½	10.77½	46.50	46.65	4.85	4.70	4.50	20.00	11.75	35.00
8	11.25	11.37½	10.77½	46.10	46.25	4.85	4.70	4.50	20.00	11.75	35.00
9	11.25	11.37½	10.77½	45.85	46.00	4.75	4.60	4.50	20.00	11.50	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.25c Conn. copper

Sheets

Yellow brass (high)	17.50
Copper, hot rolled	19.37½
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

High, yellow brass	20.25
Seamless copper	19.87½

Rods

High yellow brass	13.37½
Copper, hot rolled	15.87½

Anodes

Copper, untrimmed	16.62½

Wire

Yellow brass (high)	17.75

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	6.32½-6.45
Cleveland	6.37½-6.62½
Chicago	5.62½-5.87½
St. Louis	6.00-6.25

Heavy Copper and Wire

New York, No. 1	7.62½-7.87½
Cleveland, No. 1	7.62½-7.87½
Chicago, No. 1	7.25-7.50
St. Louis	7.75-8.00

Composition Brass Borings

New York	5.50-5.75

Light Copper

New York	6.12½-6.37½
Cleveland	5.87½-6.12½
Chicago	5.62½-5.87½
St. Louis	6.00-6.25

Light Brass

Cleveland	3.25-3.50
Chicago	3.62½-3.87½
St. Louis	4.00-4.25

Lead

New York	4.00-4.25
Cleveland	3.50-3.75
Chicago	3.50-3.75
St. Louis	3.75-4.00

Zinc

New York	2.50-2.62½
Cleveland	2.00-2.25
St. Louis	2.25-2.50

Aluminum

Borings, Cleveland	6.25-6.50
Mixed, cast, Cleveland	7.75-8.00
Clips, soft, Cleveland	13.25-13.50
Mixed cast, St. Louis	7.50-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	11.00
Standard No. 12 aluminum	14.00-14.50

dull demand American antimony eased ½-cent on Tuesday and ¼-cent further on Friday to 11.50c, New York, for spot in cases. Chinese spot held nominally unchanged at 14.00c, duty paid New York.

Equipment

Chicago — Machine tool sales have tended surprisingly upward here in the past week. Present inquiries are more active and pending business has increased. Larger lots are a feature of the betterment, while farm equipment and road-building equipment interests in particular are cited as participating in heavier inquiries. Machine tool interests are hopeful present demand will be maintained, but continue to expect a dropping off around the middle of the month.

Boston — Increasing inquiry for government shops includes 10 tools for the Boston navy yard, six heavy duty geared head engine lathes, two geared head tool room lathes and two high speed shapers; also an electric melting steel furnace, closing Dec. 20. Domestic orders for machine tools have slowed down, but numerous shops are still operating at fairly high schedules on backlogs, which include a substantial volume of export business.

Seattle—Municipal and public works requirements feature the market, private buying being seasonally off. NePage-McKenny Co., Seattle, has the contract, low bid $108,891, for furnishing electric equipment for six destroyers building at Boston, Philadelphia and Charleston, S. C. Tacoma has $19,000 available for purchase of valves and other water system items, bids Dec. 15. Seattle has opened bids for steel, bronze and brass castings, 50 street car controllers and 50 Westinghouse motors. Navy yard has received bids for disconnecting switches and transformers. Bonneville authority has called bids Dec. 13 for transformers and Dec. 15 for circuit breakers. Koppers Co., Pittsburgh, is low at $35,000 to Denver office of reclamation bureau, for furnishing ring follower gates and conduit units for the Wickiup dam, Deschutes project, Oregon.

■ Woodward Iron Co., Birmingham, Ala., will redeem $500,000 principal amount of its second mortgage cumulative 5 per cent income bonds Feb. 25, 1939. The bonds will be redeemed at the $100 par value plus interest, or holders may convert into common stock at 40 shares for each $1000. The conversion privilege will terminate Feb. 15. Total issue of these bonds of Jan. 1, 1937, was $7,054,400.

Construction and Enterprise

Ohio

COLUMBUS, O. — Columbus Packing Co., 1976 South High street, meat packer, subsidiary of Armour & Co., Chicago, plans to spend $250,000 on expansion and improvement of its plant and will install electric power equipment. Parent company's engineers in charge.

HICKSVILLE, O.—City, John Blosser, chairman board of public affairs is taking bids until noon, Dec. 16, on waterworks improvements costing $31,000, and including 150,000-gallon elevated steel tank, well-house and pumps. Burgess & Niple, Columbus, O., engineers. Certified check or bank draft 5 per cent of bid. (Noted Oct. 24.)

MARBLEHEAD, O.—Village, Anthony Turinsky, mayor, receives bids due Dec. 28 on construction of 200,000-gallon elevated tank costing $12,000 as first step in an $88,000 waterworks program. Bond issue of $36,500 carried. Consulting engineer, Wilbert Henkleman. Sandusky, O. (Noted Oct. 31.)

MARIETTA, O.—City, P. W. Griffiths, mayor, is taking separate and collective bids due at noon, Dec. 16, on Contracts A and C of a $194,770 waterworks improvements project. Includes mains, treatment plant, valves, hydrants and power equipment. Certified check 5 per cent or bond 10 per cent to accompany bid. Burgess & Niple, Columbus, O., consulting engineers.

MENTOR, O.—Village, Howard Barnes, clerk, rejected first bids and is accepting new bids due at noon, Dec. 21, on construction and equipping of water treatment plant. Paul W. Elwell, Cleveland, consulting engineer. Certified check 5 per cent to accompany bid. (Noted Nov. 21.)

MILLERSBURG, O.—Holmes Rural Electric Co-operative Inc., George Hefferline, superintendent, is preparing working drawings and will be ready for bids about Dec. 15 on construction of 121 miles of rural electric lines costing $139,000. Gibbs & Hill, New York, consultants. (Noted Nov. 7.)

PIQUA, O.—City, R. F. Buechner, manager, is taking bids due Dec. 21 on contract No. 1 of $200,000 sewage disposal plant construction. Consulting engineers, Hoover & Montgomery, Columbus, O.

New Jersey

GRENLOCH, N. J. — Grenloch Tapestry Mill, William Taylor, president, will install electric power equipment when rebuilding portion of three-story textile mill recently destroyed by fire, with loss of $50,000.

HACKENSACK, N. J. — City is making plans to build additions to two sewage disposal plants at cost of $650,000. T. Bowe, 110 William street, New York, consulting engineer.

RUTHERFORD, N. J. — Triboro sewer commission plans construction of a 3,500,000-gallon-per-day sewage disposal plant costing total of about $867,000; PWA has approved grant on project. C. Kupper, Bound Brook, N. J., engineer.

Pennsylvania

FRANKLIN, PA.—City, John Snow, engineer, is taking bids due at 7:30 p.m., Dec. 20, on construction of sewage disposal plant costing $206,000. Plans provide for sludge drying beds, concrete and glass structure, pipe systems and industrial tracks. Morris Knowles, Pittsburgh, consultant. (Noted Oct. 17.)

NEW CASTLE, PA. — Pennsylvania Power Co. has awarded $155,000 contract to James A. Utley Co., 6031 Mansur street, Detroit, for erection of a one-story power station.

OIL CITY, PA. — Oil Well Supply Co., A. R. Telt, general manager, subsidiary of United States Steel Corp., has let contract for constructing a 75 x 150-foot brick and steel storage build-

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ing and warehouse to L. O. Bouquin Co., Oil City. Estimated cost $50,000 with equipment.

New York

FREDONIA, N. Y. — State department of education, Albany, N. Y., taking bids to Dec. 22 on construction of a heating plant in connection with a $590,909 project at New York state normal school located here.

Indiana

COLUMBIA CITY, IND. — Whitley County Rural Electric Membership Corp., Homer Ummel, superintendent, has received REA allotment and probably will take bids soon on construction of 88 miles of rural power lines to cost about $55,000.

Illinois

BARTONVILLE, ILL.—Keystone Steel & Wire Co. will probably build at least one new building to replace the plant recently destroyed by fire with loss of nearly $300,000. Destroyed property had been occupied by Keystone departments in addition to W. A. Laidlaw Wire Co., Micro Products Co., and Mabey Sales & Mfg. Co.

CHICAGO — Commonwealth Edison Co., 72 West Adams street, is arranging a $25,000,000 fund to be used for expansion and improvements in its plants and electric system over a two-year period. Will install high-pressure boilers, steam turbo-generators, power substations etc. to increase present capacity by more than 125,000-kilowatts.

ELMHURST, ILL. — Hills Bros. Coffee Inc., 2 Harrison street, San Francisco, H. G. Hills, vice president, plans installation of motors and controls, power equipment, conveyors and loaders in $750,000 plant to be built on 30-acre site here.

JOLIET, ILL. — Joyce 7-Up Bottling Co. Inc., J. M. Joyce, president, plans to install electric power equipment in a new two-story beverage plant to cost total of about $250,000. Project scheduled to begin soon.

Alabama

SHEFFIELD, ALA. — Electro-Metallurgical Co., New York, has a 300-acre tract here and will build a $5,000,000 ferroalloy plant of which first unit is to cost $1,000,000. Plant will use TVA power.

Maryland

BLADENSBURG, MD. — Washington suburban sanitary commission, Tower building, Washington, has been allotted a $440,397 PWA grant in the construction of a complete sewage disposal system costing $978,661 in Anacostia valley. Project to include lines and plants.

CHESTERTOWN, MD. — City, Frances Larrimore, clerk, receives bids Dec. 16 for construction of sanitary improvements consisting of sewage interceptors, pumping station, force main, sewage treatment works and underwater outlet; estimated cost, $50,000. Whitman, Requardt & Smith, Baltimore, engineers.

District of Columbia

WASHINGTON — Veterans' bureau, Arlington building, takes bids to Dec. 20 on a $1,100,000 construction project at Dallas, Tex., which will include a boiler house, steel water tank and tower, 100,000-gallon pump and meter building.

WASHINGTON — Navy department will open bids Dec. 28 for construction of proposed $150,000 boiler plant at Puget Sound navy yard, Wash.

Kentucky

ALBANY, KY.—Town, J. F. Pierce, chairman of trustees, receives bids Dec. 16 for construction of complete waterworks, purification works and distribution system with tank and tower. J. S. Watkins, Lexington, Ky., consulting engineer.

LOUISVILLE, KY. — Joseph E. Seagram & Sons, New York, will spend $750,000 during fiscal year 1938-39 in improving their plant and installing additional equipment.

Florida

PALATKA, FLA. — City, R. M. Ingram Jr., clerk, receives bids Dec. 13 on Units A and B of project for construction of waterworks plant and water system estimated to cost $45,000. Plans provide for wells, pumps, sand filters, piping, reservoir, valves and tanks. W. A. Smith, Jacksonville, Fla., consulting engineer.

WAUCHULA, FLA. — City, L. M. Mosely, clerk, is taking bids for electric plant improvements, including 250-kilowatt diesel generating unit, for which available funds total $42,000. C. K. S. Dodd, Sarasota, Fla., engineer.

Mississippi

MACON, MISS. — City plans to construct a distribution system and whiteway costing $42,000 and will receive bids Dec. 16 for Contract No. 1. A. S. Brumby, Starkville, Miss., engineer.

NEWTON, MISS. — Town, W. H. Waldrop, clerk, will receive bids Dec. 12 for water improvements, including deep-well drilling and installation of turbine pump and electric motors.

North Carolina

CHARLOTTE, N. C. — Duke Power Co., Charles Burkholder, chief engineer, is planning a plant expansion program costing several million dollars. First unit to be constructed will be an 80,000-kilowatt steam electric generating plant, necessitating additional transmission facilities.

HENDERSON, N. C. — Corbitt Co., manufacturer of automobile bodies, will rebuild portion of plant destroyed by fire with loss of $70,000 and will install considerable power equipment. (Noted Nov. 14.)

NEWTON, N. C. — Town, Edward Haupt, mayor, will receive bids Dec. 14 for general construction of a water supply line, sewer line and two sewage treatment plants with respective capacities of 125,000 and 350,000 gallons per minute. G. S. Rowe, Newton, consultant.

WASHINGTON, N. C. — City plans to make improvements in its power plant, including a 645-horsepower stoker-fired boiler and a condenser at total cost of about $173,000.

South Carolina

GREENWOOD, S. C. — R. H. Bouligny, 433 W. Morehead street, Charlotte, N. C., has been awarded $300,380 contract to construct a power transmission line for Buzzards' Roost dam.

Tennessee

CHATTANOOGA, TENN. — Electric power board, L. J. Wilhoite, chairman, receives bids Dec. 13 for manufacture and installation of oil circuit breakers and accessories (sub-project contract No. 3-G) in substations No. 2, 3 and 4.

CLARKSVILLE, TENN. — REA has allotted $563,000 loan to Cumberland Electric Membership Corp., Wyatt Jackson, president, for completion of rural distribution system serving six counties. J. L. Goodrich, Clarksville, consulting engineer.

KNOXVILLE, TENN.—Electro-Manganese Corp. has acquired the plant of former Knoxville Table & Chair Co. near Middlebrook Pike and will remodel for use in processing manganese ore. K. M. Leute, Minneapolis, president.

KNOXVILLE, TENN.—City, M. B. Whitaker, water department superintendent, will soon call for bids on third pumping unit for Williams Creek pumping station; first bids were rejected. Cost estimated at $80,000.

Louisiana

BATON ROUGE, LA.—Ethyl Gasoline Corp., Chrysler building, New York, has awarded contract to E. I. duPont de Nemours & Co. Inc., Wilmington, Del., for construction of a complete plant to produce ethyl chloride.

HOMER, LA. — Town, Fred Jackson, mayor, is receiving bids for construction of a sewage disposal plant and waterworks improvements costing $55,000. Consulting engineer, L. J. Voorhies, Baton Rouge, La.

SHREVEPORT, LA.—Pittsburgh Plate Glass Co. has awarded contract to Werner Co., 1320 Pierre street, at $70,443 for erecting a warehouse and office building. Henry Schwarz, Shreveport, architect. (Noted Sept. 12.)

SULPHUR, LA. — Town, Wesley Trahan, mayor, is accepting bids Dec. 13 on construction of sanitary sewerage system estimated to cost $120,000. L. J. Voorhies, Baton Rouge, La., consultant. (Noted Oct. 17.)

Virginia

RICHMOND, VA. — City, J. A. Hobson Jr., director of public utilities, receives bids after Dec. 12 for construction of building to house Columbus pumping station. Project also involves waste drain to lake, electrical circuit and power supply, piping and meters. Funds available estimated to total $49,000.

Missouri

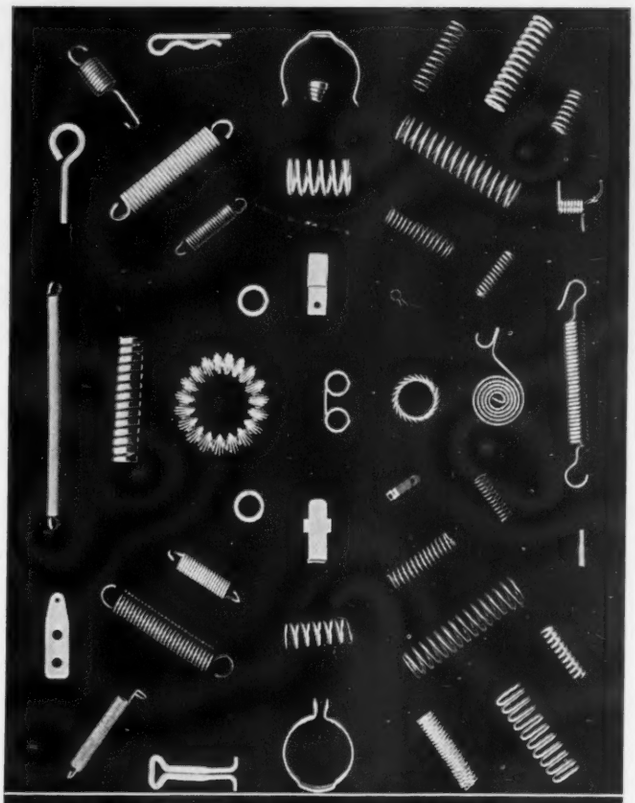
CLARKSVILLE, MO.—City will take bids Dec. 17 for construction of a municipal electric light and power plant and complete distribution system.

LATHROP, MO. — City, Gerald Cross, representative, takes bids to 4 p.m., Dec. 19, on construction of electric distribution system and street lighting system, and installation of two 150-kilowatt diesel generating units at cost of about $75,000. E. T. Archer & Co., Kansas City, Mo., consulting engineers. (Noted Oct. 17.)

OWENSVILLE, MO.—City will receive bids Dec. 19 on construction of a diesel power plant and distributing system costing total of $105,000. (Noted Oct. 24.)

PALMYRA, MO. — Missouri Rural Electric Co-operative association, P. G. Lehenbauer, president, takes bids about January 1 on construction of 55 miles of rural transmission lines costing $61,000; REA project. R. A. Donahue & Co., Macomb, Ill., engineers.

WESTON, MO. — City, Thomas Hensen, mayor, is receiving bids until 4 p.m., Dec. 16, on building construction and installation of two 150-kilowatt



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diesel generating units and auxiliaries. Cost to be about $85,000. Consulting engineers in work, E. T. Archer & Co., Kansas City, Mo.

Arkansas

CONWAY, ARK.—City will receive bids Dec. 12 on the projected waterworks improvements costing $126,130 and a sewage treatment plant to cost about $40,685. (Noted Nov. 14.)

FOREMAN, ARK.—City, H. S. Freeman, mayor, is receiving bids for constructing and equipping waterworks at Rocky Comfort, which is estimated to cost $35,285.

HUGHES, ARK.—City, G. H. Grafton, representative, is receiving bids for construction of a sewer system to cost approximately $32,000.

Wisconsin

DARLINGTON, WIS.—Lafayette county board, Edward Noble, clerk, will soon ask for bids on construction of highway garage and shops, 75 x 220 feet, estimated to cost about $75,000.

MADISON, WIS.—Wisconsin Power & Light Co., Grover C. Neff, president, will spend $1,225,000 during 1939 in improving and expanding its system. About $325,000 will be allotted for rural line construction and $900,000 for substation construction and purchase of transformers and other equipment.

Minnesota

ALEXANDRIA, MINN.—City, H. S. Campbell, clerk, takes bids to 7:30 p.m., Dec. 19, on heating plant improvements including new boiler, coal and ash handling equipment, piping and combustion controls; amount available, $151,300. Certified check 10 per cent to accompany bid. Engineers, Burlingame, Hitchcock & Estabrook, Minneapolis. (Noted Oct. 3.)

AUSTIN, MINN.—City, J. H. Weiland, recorder, accepts bids to 2 p.m., Dec. 19, on construction of sewage treatment plant (Contract B), pumping equipment (Contract C), and electrical work (Contract D). Certified check 5 per cent to accompany bid. Greeley & Hanson, Chicago, engineers.

NEW RICHLAND, MINN.—Village, J. W. Romine, president, is taking bids to 8 p.m., Dec. 17, on complete water supply system. Certified check 15 per cent must accompany bid. Druar & Milinowski, St. Paul, consulting engineers.

WINSTED, MINN. — Village, Fred Roufs, recorder, is taking bids until Dec. 19, 8 p.m., on construction of sewers and treatment plant consisting of settling tank, chlorination chamber, digestion tank and sludge beds and costing $86,700. Certified check or bid bond 15 per cent. Druar & Milinowski, St. Paul, engineers.

Texas

BENAVIDES, TEX. — City, R. Ramos, mayor, plans to construct a complete waterworks and sewerage system costing total of $140,000. Garrett Engineering Co., Houston, Tex., engineers.

CROSBYTON, TEX. — City, C. M. Huddleston, mayor, has been allotted PWA grant and has plans in progress for construction of a power plant to cost $94,000. Project involves two 120-kilovolt diesel generating units, fireproof plant and overhead distribution system. Municipal Engineering & Finance Co., Dallas, Tex., engineer.

EDGEWOOD, TEX. — City, Dr. B. B. Brandon, mayor, receives bids Dec. 14 for construction of sanitary sewer system for which available funds total $26,000. Joe J. Rady, Ft. Worth, Tex., engineer.

GONZALES, TEX. — City, S. M. Ainsworth, mayor, has voted to issue bonds to finance construction of light and power plant costing about $173,000 and including diesel electric units, powerhouse, cooling towers, poles and transformers. Garrett Engineering Co., Houston, Tex., consultant. (Noted Nov. 7.)

KERMIT, TEX. — City, Ray Clapp, mayor, will take bids Dec. 14 for building waterworks and sewer system; PWA allotted $91,350 grant and bond issue approved. Cost to total $203,000. J. E. Ward, Wichita Falls, Tex., consulting engineer. (Noted Oct. 17.)

KYLE, TEX. — City, M. K. Harston, mayor, has received PWA loan and grant for $21,750 and approved $24,000 bond issue for construction of electric system. J. W. Beretta Engineers Inc., San Antonio, Tex., consultant.

MARBLE FALLS, TEX. — City, I. B. Matern, mayor, has been allotted $32,750 WPA grant for constructing an electric distribution system. Engineers, J. W. Beretta Engineers Inc., San Antonio, Tex.

ROBSTOWN, TEX. — City, W. H. Messer, secretary, is receiving bids for construction of fireproof power plant costing $274,000. Will install diesel engine. Garrett Engineering Co., Houston, Tex., engineer. (Noted Sept. 5.)

SEAGOVILLE, TEX. — City, C. P. Murphrey, mayor, takes bids Dec. 13 for construction of sanitary sewer system; $20,000 available. Joe J. Rady, Ft. Worth, Tex., consultant.

SOMERVILLE, TEX. — City, H. C. Harden, mayor, has PWA loan and grant of $40,000 and $50,000 bonds available for contemplated construction of electric distribution system. Garrett Engineering Co., Houston, Tex., consulting engineer.

Kansas

DODGE CITY, KANS.—Shore Machine Works, A. D. Shore, president, plans to install electric power equipment in rebuilding portion of plant recently burned with loss of over $80,000.

WICHITA, KANS.—Atlas Iron & Metal Co., A. J. Bachus, subsidiary of Southern Iron & Metal Co., Dodge City, Kans., will construct a 50 x 150-foot fireproof building costing $10,000 and will install yard equipment costing about $20,000.

North Dakota

FINLEY, N. DAK.—City, A. J. Karres, mayor, receives bids until 2 p.m., Dec. 19, on construction of contemplated waterworks system costing $46,500; project includes 50,000-gallon storage tank. Certified check $500 or bid bond full amount of bid. Dakota Engineering & Construction Co., Valley City, N. Dak., consultant.

JAMESTOWN, N. DAK.—State board of administration, Bismarck, N. Dak., A. B. Welch, secretary, takes bids to 2 p.m, Dec. 19, on new equipment for power house for which funds available total $143,673. W. F. Kurke, Fargo, N. Dak., engineer.

MINOT, N. DAK.—State board of administration, Bismarck, N. Dak., A. B. Welch, secretary, takes bids to 2 p.m., Dec. 19, on boiler plant improvements for which $57,552 is available. (Noted Sept. 5.)

VALLEY CITY, N. DAK.—State board of administration, Bismarck, N. Dak., A. B. Welch, secretary, is taking bids to 2 p.m., Dec. 19, for new power house equipment including boiler, pumps and controls. Funds available total $27,020. W. F. Kurke, Fargo, N. Dak., architect. Certified check 5 per cent to accompany bid. (Noted Sept. 5.)

Nebraska

COLUMBUS, NEBR.—Loup River public power district, C. B. Fricke, president, takes bids to 10 a.m., Dec. 17, on construction of about 220 miles rural lines. D. J. DeBoer, Columbus, chief engineer. (Noted Nov. 21.)

HASTINGS, NEBR.—Central Nebraska public power and irrigation district is taking bids to Dec. 30 on manufacturing and installing at Jeffrey Canyon and Johnson Canyon power plants quantities of switchgear, circuit breakers, switchboards, hydraulic panels, battery chargers, lightning arresters, storage batteries and transformers.

LINCOLN, NEBR.—PWA has approved grant to the city, O. S. Copeland, mayor, to aid financing of improvements at waterworks, including three new pumps with fittings, valves and pipes. D. L. Erickson is city engineer.

Iowa

CASCADE, IOWA—City, F. A. Hurt, clerk, is accepting bids until 10 a.m., Dec. 26, on construction of a power plant to cost about $110,000. C. M. Stanley, Muscatine, Iowa, consulting engineer.

WEST POINT, IOWA—City, E. H. Greene, representative, takes bids to Dec. 16 on proposed construction of sewage disposal plant costing $32,380. Hall Engineering Co., Centerville, Iowa, engineer.

Wyoming

SUNDANCE, WYO.—City, E. J. Ackerman, clerk, takes bids to 10 a.m., Dec. 23, on power plant building, power equipment and distribution system costing about $47,000. J. O. Kammerman, Rapid City, S. Dak., consulting engineer. (Noted Oct. 31.)

Montana

BILLINGS, MONT.—United States department of interior, 210 Pratt building, C. E. Brashear, supervising engineer, takes separate bids to 10 a.m., Dec. 28, on boiler feed pump, deaerating feed water heater and three watertube boilers for delivery at Pipestone, Minn.

ST. IGNATIUS, MONT.—Flathead Irrigation project, G. L. Sperry, chief engineer, will soon take bids on three 3000-horsepower motors, four 2500-kilovolt-amperes transformers and steel pipe.

Pacific Coast

LAGUNA BEACH, CALIF.—Laguna Beach water district is receiving bids due Dec. 17 on construction of pipe line and installing two booster pumps at cost of $88,000. A. J. Stead, city hall, engineer.

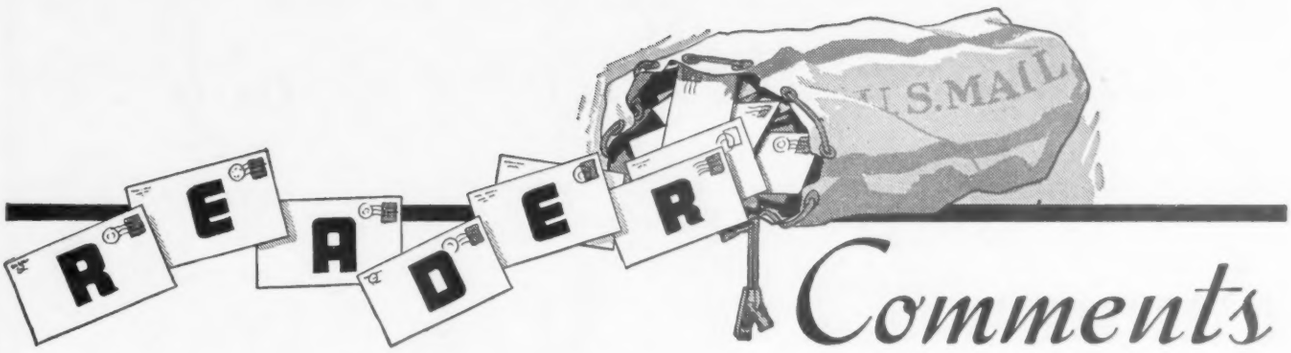
SACRAMENTO, CALIF.—Sacramento air depot, construction quartermaster, takes bids to Dec. 21 on constructing traveling bridge crane in air corps engineering shop.

SILVERTON, OREG.—City will receive bids Dec. 20 for construction of sewage treatment plant estimated to cost $47,000. Baar & Cunningham, Portland, Oreg., engineers.

FT. LEWIS, WASH.—McChord air field will receive bids Dec. 21 for construction of a heating plant with four boilers, steam heat equipment and automatic coal feeders.

Canada

GRAVELHURST, ONT.—White Aircraft Co. of Canada Ltd., Toronto, has let contract for a $50,000 airplane factory, 100 x 100 feet, to Walter Davidson & Co. Ltd., 188 Duke street, Toronto.



Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Reciprocal Buying an Evil

To the Editor:

Under the attack on business by the present administration we manufacturers like to feel that we are martyrs. We know the attack is unjustified, in general. Government, however, has uncovered some abuses which are real enough to justify action in some cases.

One of these abuses which as yet has not been the subject of regulation but which will and perhaps should be, is that of reciprocal buying. This exploded theory is continued only because of its age, not because anyone in industry finds it a satisfactory method of placing business.

Industry, at great expense, sets up a purchasing department, an inspection department and an engineering department, to produce material of proper price and quality. After having done this they put in a reciprocal relations department who override the decisions of the buyer, the inspector and the engineer, and place business merely because of the suppliers' previous purchases from their company. The policy results in frequent strained industrial relations since no one can buy in a volume to satisfy the reciprocator. Not only that, but the distribution is never fair from the seller's point of view.

Reciprocal buying results in higher prices since the reciprocator cannot get the best price available. It results in lower quality since the reciprocator cannot insist on quality. It results in lack of standardization which enormously increases cost of upkeep.

I can see the joy with which a LaFollette, or a Roosevelt, or other muckrakers, will pounce on this industrial foible to show how incompetent is the management of American business.

With that proof the New Deal can show it is necessary for government to guide, direct and protect industry. Thus only can it be kept solvent. As a matter of fact, who can show that government is not right in such conclusions? Result: One law, a million new jobs and a billion new taxes.

The worst of it is that in this case the government would have a perfectly clear case to prove its point. No one could take the untenable position that reciprocal buying is anything but asinine and wasteful. However, in the hands of governmental regulation for its elimination, a waste will be turned into regimentation from which industry perhaps can never recover.

J. F. LINCOLN

Lincoln Electric Co.,
Cleveland

Employe Loyalty an Asset

To the Editor:

Our problem of selling industry to the public is much more localized than is true with many of the larger companies, but industry as a whole should be interested in developing a good record with the public generally.

To date, we have done little which has been intended directly to influence the local public. We have, for several years, however, been engaged in an intensive program of training and understanding for our superintendents, foremen and assistant supervisors and we are inclined to feel that this may be the most effective way to do the public job as well.

Articles which are published and deeds which are done for the express purpose of influencing public opinion often miss their mark. It is extremely difficult to forecast public reaction, especially when so many people seem to depend upon others to supply their interpretation.

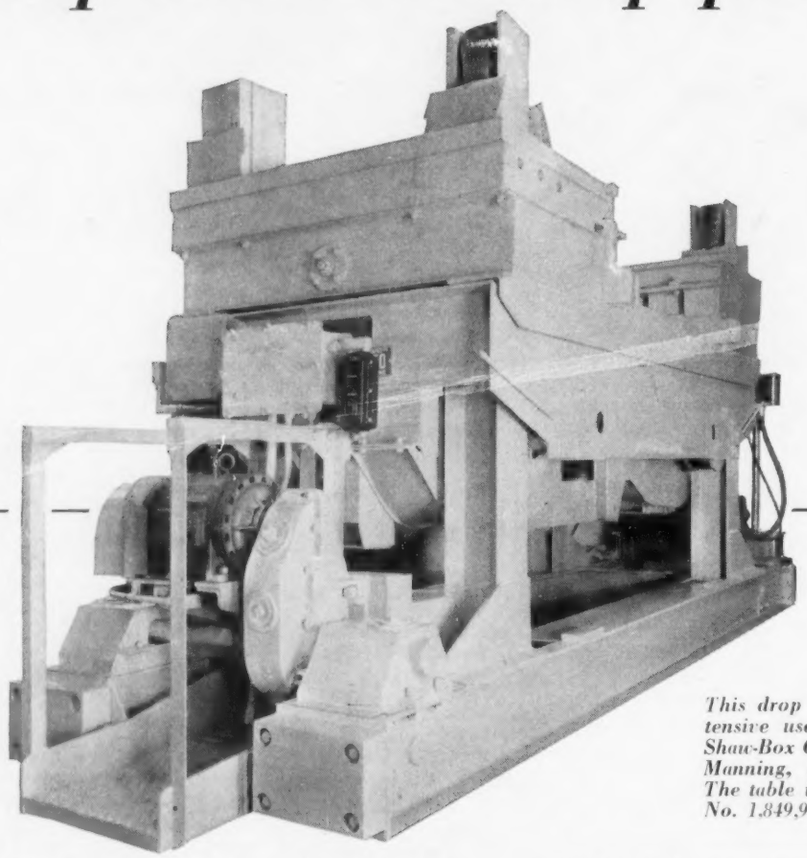
Supervisory training as a means of encouraging favorable public opinion of industry may be one of the slower methods, but it is doubtless more permanent and reliable. If fair and proper policies are adopted by industrial management, and are understood and appreciated by the supervisors, who make the direct contacts with employes, it can be expected that a large percentage of employes will intentionally and unconsciously do the job of selling the local public. When we can deserve and have enough of this type of salesmen we should have little to worry about.

All industry must admit that its employes are responsible for much public opinion which exists. If our policies deserve favorable acceptance there is probably no better way to develop good public relations than through our supervisors and employes.

R. A. CHAFFIN,

Director Industrial Relations,
Continental Steel Corp.,
Kokomo, Ind.

How FLAME-CUTTING *improved this drop pit table . . .*



This drop pit table illustrates an extensive use of flame cutting by the Shaw-Box Crane and Hoist Division of Manning, Maxwell and Moore, Inc. The table is protected by U. S. Patent No. 1,849,972.

THIS 50-ton capacity railroad drop pit table is light in weight—yet is exceptionally strong—because many of its parts were flame-cut from strong, tough, rolled steel. Flame-cutting—an application of the oxy-acetylene process—has made it possible to economically fabricate this drop pit table from rolled steel. Thus its weight is decreased and its strength increased. It utilizes a smaller power unit and consumes less power because of the reduction in weight of the moving parts. Also, the time required to build this drop pit table, and its overall cost, have been reduced.

Other Oxy-Acetylene Applications

Flame-cutting is one of the many applications of the oxy-acetylene process which are useful and profitable in the manufacture of equipment. Parts subject to exceptional wear can be flame-hardened or hard-faced. Where annealing is required, surfaces can be flame-softened. Parts, even when made of different kinds of metal, can be welded to form strong and long-lasting units.

Linde Can Help You

Years of experience with all the oxy-acetylene process applications have made it possible for Linde engineers to assist numerous concerns in improving many kinds of metal products. A wealth of engineering and technical material is available from the nearest Linde office. This may be able to help you improve production speeds and lower overall costs. Write for information.

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